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ORIGINAL ARTICLES.

CHRONIC MYOCARDITIS.[1]

I. MORBID ANATOMY AND PHYSICAL SIGNS.

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THE more recent studies of cardiac pathology impress one more and more with the force of the old term *morbus cordis*, employed in a generic sense to include the phenomena of chronic cardiac disease. Indeed, Laennec was not far from the truth, in a clinical sense, although not quite correct in his pathology, when he devoted six chapters of his work to hypertrophy and dilatation, five to atrophy, softening, induration and fatty degeneration, and one only to valvular disease. When you think of it, if the heart muscle is healthy, chronic valvulitis yields but few symptoms. If the former structure meets the physiological demands required by the valvulitis, in most lesions no symptoms arise. Valvulitis of the aortic leaflets, admitting regurgitation, is the only lesion which may cause symptoms independent of the state of the myocardium. While the chronic valvulitis may exist for a life-time with a minimum symptomatology, yet in striking contrast we see chronic disease of the anatomically associated structure—the myocardium—with a most complex pathology and symptomatology. It is not common to have chronic myocarditis, without some hypertrophy, dilatation, atrophy, fatty degeneration or infiltration, singly or combined, or to have any of the latter conditions without myocarditis. In consequence the symptoms of myocarditis are intermingled with those due to other mural changes. Such mingling of pathological conditions must imply a common fundamental causation. Such we see in the state of the pericardium (local myocarditis) or of the coronary arteries (fibrous myocarditis), on the one hand, or, on the other hand, in varying conditions dependent upon intracardiac pressure (myocarditis with dilatation after valvulitis, emphysema or nephritis), or upon the nutritional value of the blood (myocarditis of anemia with fatty degeneration—the fatty heart), or upon the direct but general action of infectious or toxic agencies (parenchymatous myocarditis).

Myocarditis after pericarditis is exemplified in the case of A. E., aged sixty-three years.[2] Heart enlarged; weight 19 ounces; enormous amount of pericardial fat, and distinct chronic pericarditis, there being firm adhesions, nearly obliterating the sac. Hypertrophy is general, the right ventricle being considerably thickened. Aortic valves thickened, with dilatation approaching valvular aneurisms. Mitral valve also much thickened, stiffened and dilated. No calcification. Aorta normal. Tricuspid valve decidedly dilated. Heart muscle flabby, containing some white patches, suggestive of fatty metamorphosis. Cavities decidedly dilated.

Myocarditis with dilatation is frequently seen as the terminal event in cases of chronic lung disease, as emphysema (right heart), or of chronic nephritis or of arteriosclerosis. It was typically seen in the case from which the specimens to be described were removed.

Dilatation of Heart.—A. L., aged fifty-nine years. Heart, in pericardium, extended in fourth interspace from nipple line on right to two inches beyond left nipple in fifth interspace. Pericardial sac contained about the normal amount of fluid. Heart weighed 28 ounces. There was enlargement of both sides. The veins over surface were distended. The cavities were filled with antemortem clots extending into the vessels. Over the right ventricle there was a milky-white patch about three inches in diameter; over the apex another similar patch the size of a quarter of a dollar. The left ventricle was more than one inch in thickness. The muscle was pale red, quite soft and fatty. The papillary muscle was hypertrophied. The anterior muscle was fully half an inch in breadth at base. Tips were fibroid. Chordæ tendineæ thickened and contracted. The cavity was dilated, four fingers being admitted into valves. The right cavity was enormously dilated. The tricuspid admitted four fingers. The muscles were soft, pale and fatty. The fatty degeneration was not uniform, but in various areas. All the papillary muscles were hypertrophied. The mitral valves were thickened at edges. The bases were surrounded by a ring of atheroma (calcareous) of irregular thickness in continuity. The aortic valves were extensively diseased; the inter-coronary leaflets thickened along edges and at base. The coronary arteries were free from atheroma, except at the mouths, which were dilated.

The remarkable changes in the heart muscle seen in pernicious anemia are too well known to require description, as also are the appearances of parenchymatous myocarditis.

Fibroid Heart.—Far more frequently we find myocarditis, either local or general, the result of coronary artery disease. It was well seen in a case which presented the typical fibroid heart. T. L., aged eighty-one years. The heart was large, without much subpericardial fat. Recent patch of pericardial thickening was seen over apex. Right ventricle enlarged and contained antemortem clot. Muscle very hard, red and

[1] Read in part before the New York Academy of Medicine, and in part before the Virginia State Medical Society.

[2] For microscopical report of the cases reported herein, see Musser and Steel, Trans. Phila. Path. Soc., Feb., 1898, Vol. I., New Series.

firm. Left ventricle hypertrophied at base, 1¼ inches thick; at apex ½ inch thick, tapering. Papillary muscle of anterior cusp thickened, hypertrophied and fibroid at tip. Fibrous substance extends far up the chordæ tendineæ. Papillary muscle of posterior cusp short, thick and fibroid. Mitral valves slightly thickened and atheromatous. Muscle of left ventricle pale, firm and not fatty. Aortic valves thickened at edges but competent. Aorta the seat of extreme atheroma lined by calcareous flakes. Both coronary arteries atheromatous. Valves of right heart normal. Aorta extremely dilated in ascending portion.

Local Myocarditis.—In the following the appearances were even more striking. R. B., aged fifty-eight years. Heart was enlarged and weighed 20 ounces. Cavities were dilated. In left ventricle, old thrombi were adherent to walls, and there was a recent clot. Papillary muscles enlarged. Slightly fibrous tips, otherwise presenting but little degeneration. Vessels in papillary muscles very distinct, undoubtedly enlarged in caliber. Underneath papillary tip in substance of muscle was a dark red area. Muscle at left apex pale red, mottled yellow, rather firm material. These areas of yellow fibrous matter in the ventricle were next to the cavity, and usually most pronounced when opposite thrombi. Anterior ventricular septum much thickened, very firm and on section presented yellowish areas alternating with dark red, with normal muscle interwoven. The papillary muscle of the anterior cusp presented the greatest change. Left auricle dilated moderately. Mitral valve admitted three fingers. Some areas of atheroma. The tricuspid orifice was enormously dilated; valve normal. Papillary muscle presented some yellowish-white fibrous change. Muscle was firm, mottled in areas, presenting the most marked change below the pulmonary valves. Auricle much dilated; cavity enlarged and much hypertrophied. Some opacity at base of tricuspid and undoubted degenerative changes. Anterior coronary artery markedly atheromatous, presenting a recent antemortem clot and an old thrombus, which evidently occluded the vessel largely about one inch from its origin. Surface of heart presented dark red or normal color and light red areas, alternating with yellowish mottling. This area was over the surface of the left ventricle, two inches wide, extending from the base to the apex. It appeared to include that portion supplied by the vessel which was the seat of thrombus. The auricular appendix presented marked areas of yellowish-white fibroid degeneration. Orifice of posterior coronary somewhat occluded, not, however, presenting so rigid and marked appearance. Fat along this artery was abundant, while along other branches markedly lessened. No thrombi in the lumen of the large veins. Marked and most prominent degenerative changes were seen in the muscles, independent of the fat. Aortic valves normal. Aorta atheromatous throughout entire course.

Local Fibrous Myocarditis.—Or again we see in arteriosclerosis the following appearances of local fibrous myocarditis. J. H., aged eighty-six years. Heart weighed 16 ounces. Left ventricle three-quarters inch in thickness and apex one-eighth inch thick. Color red, with soft subendocardial staining. Papillary muscle rather small. Fibrous at the tips; yellowish color at points. Areas quite marked on section of the muscle. No "tabby-cat" striations of muscles. Chordæ tendineæ short and thick. Mitral leaflets thick. Edges indurated, but not calcareous. Competent valves. Aortic valve thickened. Corpora not enlarged. Some thickening across middle valve. Base of valves atheromatous. Coronary pouch quite dilated; valves apparently dilated. Aorta dilated, with some atheroma. Coronary artery (right) dilated; walls thickened. In the middle of the artery there is a patch of atheroma (calcareous) half an inch long. Artery seems to be wider below than above. Left coronary artery walls thickened. No atheromatous patches. Right ventricle walls thin and soft. On section from the middle of the cavity to apex in center of muscle is seen a buff-colored leathery line averaging one-sixteenth inch in thickness, more marked toward the apex. A number of the papillary muscles in apex are yellow in color, and on section show fatty appearance. The left ventricle is one-eighth inch in thickness. The cavity is dilated.

Leaflets of posterior coronary valve are thickened at margin and are atheromatous; more on the anterior. The muscles are not dilated. The muscle is fatty and fibrous on section. Left auricular endocardium is thick and dull. The muscle is pale yellow in color. In appearance the walls are leathery, being wrinkled and tough. Chicken-fat clots were found in the ventricles and extended into the vessels. The cavity of the left ventricle was dilated. Atheroma of aorta extended throughout its course. It was observed in internal mammary, renal and colon areas. Further examination not made.

Myocarditis and Valvulitis.—The degenerative changes seen in the heart with valvulitis were well exemplified in the following case. W. H., aged twenty-four years. Heart enlarged; left ventricle hypertrophied. Muscle firm. Same appearance in intraventricular septum of fibroid change as just described. Papillary muscle small. Fibroid at left. Chordæ tendineæ contracted. Mitral orifice admits two fingers very readily. Mitral valves are thickened, atheromatous. The aortic valves contain a few atheromatous patches, particularly at the base. The coronary arteries are atheromatous, elongated and twisted. The aorta is dilated in ascending portion throughout the seat of extensive atheroma.

Local myocarditis was found in the following cases:

Local Myocarditis and Valvulitis.—J. P., aged seventy-six years. Heart weighed 25½ ounces. Right side flaccid. Right auricle contained about three ounces of pure blood. Left side flaccid. Auricle contained about three ounces of blood, ventricle about four ounces of fluid blood. The walls of right ventricle slightly thickened. Ven-

tricle contained about five ounces of fluid blood. The walls of left ventricle were somewhat thickened and in the lower posterior portion, near the apex, an area one inch in diameter and extending nearly through the thickness of the wall was white and fibroid. The pericardium, particularly in left side, was thickened and showed scattered white spots, about one-quarter to three-eighths inch in diameter. The aortic valve, calcareous and slightly incompetent. Atheroma of coronary arteries. Aorta atheromatous, containing calcareous particles.

Local Myocarditis.—J. R., aged forty-nine years. Left cavities filled with soft black clots. Left ventricle firmly contracted and hard. Right auricle contains yellow clot, some black clot and fluid blood and is distinctly enlarged. The valves of the right side of the heart are normal. The Eustachian valve shows distinctly. The coronary sinus will easily admit a small finger, and does not show any valves. There is no opening through the fossa ovalis. The muscle of the right heart is unusually firm, 12 mm. thick, pale in color; papillary muscles are mottled. The left auricle is normal. The mitral valve is somewhat thickened along the edge but not retracted. The anterior surface of the anterior leaflet of the mitral valve shows several patches of atheromatous infiltration. The left aortic valve shows a patch of calcareous infiltration at its base. The other aortic leaflets are normal. There are many small patches of atheromatous infiltration around the sinus of Valsalva and around the coronary arteries. The muscle of the left ventricle is about 23 mm. in thickness. The color of the outer portion of the muscle is brown; the deeper layers are yellow. The papillary muscles are mottled and very pale at tip. The muscle of the left ventricle is not enlarged. The coronary arteries are extremely atheromatous. Weight 18 ounces.

Time forbids allusion to the clinical course of the various forms of myocarditis just referred to. What has just been said of the complexity of the phenomena can be appreciated by noting the following: (*a*) Myocarditis secondary to pericarditis has the symptoms of dilatation or of dilated hypertrophy and sometimes of that curious group of symptoms associated with mediastinitis, hepatitis and splenitis in which the predominate or unequivocal symptoms are hepatic and splenic, with ascites; (*b*) myocarditis following valvulitis or peripheral obstructions (lung or kidneys) is associated with symptoms of dilatation; herewith are intertwined, on the one hand, the symptoms of emphysema or nephritis; or, on the other hand, those of valvulitis; the physical signs of the latter condition obtain; it is most difficult often to go beyond the diagnosis of dilatation of the heart; (*c*) myocarditis of toxic and anemic origin; the fatty heart is associated with symptoms of grave secondary or pernicious anemia or of toxemias, as from tobacco or mineral poisoning or from chronic infections; (*d*) fibrous myocarditis—coronary artery disease.

It is to the clinical expressions of this form of myocarditis I beg leave to call your attention. In the description of the lesions it may have been observed that most of the patients were old subjects, and hence I gave to you an anatomical account of the senile heart—the fibroid heart. Clinically cases of senile or fibroid heart are so mingled with the other phenomena of senility that we are not wont to ascribe the symptoms to the cardiac lesion more than to the associate degenerative lesions of other organs of the body. Moreover, the vegetative inactive life led especially by those who become inmates of infirmaries dulls the sensibilities, reduces the vascular strain or tension to a minimum and hence effaces or obliterates most of the phenomena of myocarditis.

That form of chronic myocarditis which comes home to us more forcefully is the one seen in subjects just past the prime of life—mostly in males. Their career has been one of active strife, of the surmounting of difficulties. They have usually been accustomed to the good things of the earth and perhaps have been victims of early syphilitic infection.

March 9, 1898, I was consulted by T. W., manufacturer, aged fifty-eight years; married; has children. Uses tobacco and stimulants moderately. Father died of old age at ninety-three, mother died at eighty-seven, brother died four years ago. Patient's general health always good until present trouble. Never had rheumatism or gout. Prior to six years ago worked very hard. One year ago began to suffer from oppression or accumulation of mucus requiring cough; gradual increase in difficulty of breathing and past few months oppression or weight on heart. At present, smothering at night, necessitating sitting up in bed. Past year, swelling about ankles at night. Coughs in morning to raise mucus (sticky). Appetite good; no indigestion; gaining in weight, now 240 lbs., but is losing strength. Bowels regular. Feels languid and has dyspnea on slight exertion. Is prematurely old. High-tension pulse. Artery elongated. Marked accentuated aortic second; uncertain murmur at second aortic. Heart's impulse not seen or felt. Apex sound loudest at fifth interspace. Both tricuspid and mitral are feeble. Color pale on exertion. Hands dusky.

March 14th: Tired in morning; wants to sleep on reading.

March 21st: Pain and weight better. Can breathe much more freely. Sleeps without smothering at night. Pulse 96.

October 1, 1897. J. H. J., merchant; aged fifty-five years; married; no children. Until three years ago was an inveterate smoker. Uses no stimulants. Formerly used coffee; now none. No unusual hours of wakefulness. Meals regular. Fast eater and drinks much water. Syphilis in 1863, primary and secondary. Has not been South or exposed to malaria. No acute disease. Had bilious attacks. Father died of bilious trouble, aged seventy-two. Mother died as result of accident. One sister living and healthy. One brother died of consumption of bowels. Two and

a half years ago continuous headache, which seemed to affect memory, partly occipital and partly frontal. This headache continued one and a half years. One dose of bromocaffeine would relieve. Irregular as to time of day in severity; not increased by any known cause. Nine months ago began to be short of breath. In July very bad, but now better. Dyspnea increased by walking and ascending stairs, but can ride wheel. The oppression occupies a circle about eight inches; not worse after food. Weight formerly 200, now 180; reduced by disease. Appetite fair; no nausea. Discomfort two hours after eating. No flatulency, but dull heavy pain, with desire to sit up straight. Dyspnea not worse after eating. No palpitation; no fainting.

Physical examination showed patient to be somewhat pale, with sallowness; said to be natural. Flabby. No scars; no eruption. Heart a little to left. Apex feeble. Impulse feeble in fifth interspace inside nipple line. Not enlarged upward. Gallop rhythm and slight intermittency and irregularity. Accentuated second aortic greater when standing up. Gallop rhythm greater with recumbent posture. High arterial tension. No venous phenomena.

November 28, 1897. Until yesterday quite comfortable. Past twenty-four hours some shortness of breath and gastric disturbances. Color better; strength better. Occasionally some dyspnea, but not so frequently as formerly. Does not rise to pass water. Muscular sounds of heart better. No accentuation. Some muscular pain in chest. On talking or reading gets distress in chest; has to stop on account thereof.

December 8, 1897. More dyspnea past week. Last twenty-four hours pain and soreness in chest. On physical examination liver still large. Heart's action feeble and irregular with high tension and gallop rhythm. Bowels irregular as to character. Some headache and oppression. No enlarged glands.

December 13, 1897. Liver not tender now.

January 19, 1898. Numbness in arms and feeling as if going to drop off, from elbows down; begins shortly after exertion and stops as soon as walks.

February 2, 1898. Heart irregular. Dyspnea considerable.

February 16, 1898. Heart regular. Dyspnea continues. Some numbness. Apex outside middle clavicular line. Mitral and tricuspid murmur, and gallop rhythm at apex.

March 10, 1898. Death from apoplexy.

The form of chronic myocarditis that occurs at this period of life has some special clinical expressions too often not referred to the heart. Some of them have "pain" for their most prominent symptom; in others "dyspnea" is the most severe; in others syncopal or apoplectiform attacks and the curious Stokes-Adams syndrome. In still others, distressing arhythmia occurs. While more or less special symptoms pertain to each individual, the physical appearance and the physical signs are common to all.

Physical Signs.—Of these most common is the sallow pallid countenance. This is most striking. Rarely can you be wrong in the inference, when such persons present themselves, that the endarteritis has involved the coronary artery and that the myocardium is off. A general endarteritis may be present for a long time and yet no change occur in the complexion. Interstitial nephritis I have seen progress slowly, and yet no change in the complexion. The onset of this hue is generally synchronous with the degenerative cardiac lesion and usually cardiac symptoms or physical signs are found coincidently; the endarteritis involving the coronary arteries.

With the sallow countenance, the earthy complexion, a prematurely old appearance of the individual manifests itself, in the color of the hair, the baggy eyelids and the abundance of wrinkles.

With the external appearance common to most cases the results of physical examination usually tally. In the first place there is evidence of endarteritis in the vessels. The palpable, often tortuous vessels show thick walls and high tension. The temporal arteries are prominent and we have the other indication of degeneration, the *arcus senilis*.

The physical signs of the heart are those of the (*a*) myocarditis alone, or those of (*b*) myocarditis plus some hypertrophy, or those of (*c*) myocarditis plus dilatation. The physical signs of myocarditis are those of feeble or absent impulse; or, if palpable, of apex impulse displaced to the left; of marked increase in the area of absolute cardiac dulness and of characteristic auscultatory phenomena.

The latter phenomena are those either of a systolic shock, greater than the force of the impulse would lead us to believe to be present, or of feeble muscular sound. In the early stages the former exists, and it continues later if hypertrophy co-exists. From the first, or at least early, we have gallop rhythm, or reduplication of the systolic sounds. This reduplication may be heard over the right heart or more distinctly over the left heart; sometimes it is heard all over the precordia. My impression is it is more commonly heard in the parasternal line at about the fourth rib. It may be more marked in the supine position and is generally more marked after exertion. It may disappear after a stimulant is taken or if the heart is stimulated by fever. Reduplication of the second sound also obtains, but is less frequent in the myocarditis of coronary artery disease than in that due to valvulitis or nephritis. In uncomplicated cases murmurs are not heard until late in the disease. Sometimes, however, we hear a systolic murmur at the fourth rib, greater in the recumbent posture. This murmur is soft, low in pitch and so often heard in the parasternal line that it is my custom to call this line the myocardial line. Again, it is at the tricuspid or even may be in the pulmonary area—when it is probably, although not necessarily, hemic.

My studies have not followed so closely and

exhaustively as their importance demands the brilliant observations of Sewell. I cannot help but think with him the papillary muscles are the source of the auscultatory phenomena of myocarditis whereby leaflets do not coapt synchronously, or areas of the muscle synchronously contract.

When dilatation supervenes, if it does, the physical signs change in keeping with the physical condition of the heart. Here however, the auscultatory signs of insufficiency at the mitral and tricuspid orifices are predominant, rarely at the aortic; accentuation of the pulmonary second sound is a frequent sign, with low tension pulse and engorgement of the venous side of the circulation.

The pulse is like that of endarteritis. The artery is readily palpable, isolated with ease, showing high tension, and while apparently strong because of a quality of fulness which with the hard vessel gives a feeling of strength, it is actually feeble. The arteries are fibrous but not necessarily atheromatous. Indeed, the patient with pronounced atheroma will probably not have symptoms at least of endarteritis and will die of cerebral thrombosis or of senility alone, or of intercurrent or terminal infections. Our middle-aged patient with endarteritis does not necessarily end with advanced atheroma, but dies of apoplexy, nephritis, angina or sudden heart asystole.

The myocarditic heart of fatty degeneration—the fatty heart—presents some similar signs. A visible impulse is wanting and any palpable impulse is felt as a slap against the chest wall. The area of dulness is normal or slightly increased; a loud hemic murmur at any orifice, but most frequently at pulmonary and aortic valve, may be heard. Just as frequently the sounds are almost inaudible, the second sound at the base alone is conducted to the ear. There is pulsation of the vessels.

We may say, then, that myocarditis may exist (1) without definite physical signs—a rare occurrence I believe; (2) with signs of moderate cardiac hypertrophy, marked reduplication being the only physical sign and of significance only when coupled with signs of endarteritis; (3) with physical signs of dilatation; (4) with physical signs of fatty degeneration; (5) with the physical signs mentioned, which in the aggregate are of great significance.

PROLONGED MEDICATION, WITH SPECIAL REFERENCE TO DIGITALIS.

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SEVERAL meetings of the German Congress of Internal Medicine have discussed the effects of digitalis when given continuously for a long time. That question was also raised in a recent discussion, mainly by Dr. Robert Ingram and Dr. Frank Scherer, before the Academy of Medicine of Cincinnati.

The woful stories of its cumulative action were told and retold. Indeed, I dare say that there is no careful or careless practitioner that has not observed it; there may be nausea, vomiting, retarded or irregular pulse, and collapse. When I was young I saw it often, mainly after large and repeated doses, and remember well that I believed that I obtained a salutary effect—in pneumonia, for instance—from that very action. But after all time has taught me several things. I now know, for instance, and have acted on that knowledge for more than a decade, that in many bad cases of dilatation of the right heart, with cyanosis and orthopnea, when nothing but a large venesection appears to hold out a promise, one, two or three doses each of ten or twelve grains of digitalis, given at intervals of three or five hours, will contract the heart and restore pulmonary and general circulation; that, on the other hand, in chronic conditions of weak heart, of either muscular or nervous origin, or of insufficient action caused by pulmonary obstruction—as in chronic bronchopneumonia or in tuberculous infiltration—small doses of digitalis, that is, from 4 to 6 grains (0.3-0.4) daily, or its equivalent, may be given for weeks and months and even years without any hesitation. Such doses may be ordered while the patient is not expected to be seen for weeks or months. Indeed, there is hardly a day when I am not obliged to prescribe them to patients who I know will not reappear for a month or more. In most cases I prescribe either from four to six doses daily of Squibb's or any other good fluid extract, or the solid extract of the Pharmacopœia in the shape of pills, 1½ grain (0.1) daily, usually ½ grain three times a day, almost always in pills, rarely by itself, often in combination with sparteine, or strychnine, or arsenic or other drugs, as the case may require. Such combinations are generally observed to be useful, as nosologically they are required by the fact that the heart is not a uniform body but a combination of muscular, vascular, and cerebrospinal and sympathetic nerve fibers; that we have but rarely to deal with an affection of only one of them, and that the theoretical demand of only one remedy in a prescription looks well on a platform, as the ornamental trimming of an impressive address to the young, but gives one but a poor show at the bedside.

Patients who take digitalis in this way do not show a cumulative effect, nor are they getting accustomed to it to such an extent as to lose the benefit of its action. Indeed, their heart requires a daily stimulation and daily doses. Mercury is given for months, iodides for months, not only in syphilis but in the cardiac ailments of atheromatous old age where digitalis is not tolerated, and in asthmatic conditions. Arsenic is administered in psoriasis, lymphomatosis and sarcomatosis for months and years with rarely an interruption unless the doses be excessive. Phosphorus demands a course of six or eight weeks to break up a bad case of rhachitis. Thyroid, thymus, or suprarenal gland is required for many months or even years to accomplish the end in view. Every-

body knows that and should add digitalis to the list of his drugs that ask for continued small doses when a continued effect is expected.

This looks so simple and *is* so simple that I never knew these thirty or forty years that I did anything which required discussion. During all this time I practised this method, taught it and mentioned it in papers, for instance, in one on "Arsenic and Digitalis in the Treatment of Consumption," read before the New York State Medical Society in 1884. Great, therefore, was my astonishment when before the Seventeenth Congress for Internal Medicine, two years ago (1899), Dr. Grödel of Nauheim spoke in favor of continued small doses of digitalis in appropriate cases. He was frowned down by most of the celebrities present, but soon Kussmaul[1] published his cases of continued digitalis treatment, and he is not usually frowned down. Thus it happened that this year public opinion veered rather in the direction of Grödel's position on that question, mostly with the understanding, however, that a careful watch must be had over the patient. When the observations of the past two years will have been confirmed by those of the next ten, that careful watch will be discontinued as unnecessary.

In my paper read before you in 1884 I discussed the effect of small doses of digitalis continued a long time and their action in pulmonary phthisis. I then spoke as follows: "In the vertebrate, digitalis increases the energy of the heart muscle and the volume of its contraction. Thereby it increases arterial pressure and diminishes the frequency of the pulse. In this connection it is of no consequence whether the irritation of the inhibitory nerve is the primary or the secondary element. By increasing pressure in the arteries, besides favoring the secretion of the kidneys, it improves the pulmonary circulation, empties the veins and thereby accelerates the circulation of the lymph and tissue fluids. Thus, while having an immediate effect upon the heart and lungs, it exerts a powerful influence on assimilation and elimination, that is, nutrition in general.

"Therefore, both the local and general effect of digitalis are invaluable in all stages of phthisis. While, however, they may relieve in the last, they are a healing element in the first stages; the congestive and nutritive changes constituting the preparatory and, in part, the advanced stages of consumption are favorably influenced. I seldom treat a case of pulmonary tuberculosis without it. Very little care is required to avoid disagreeable results. Cumulative effects are either the consequence of excessive or too frequent—unnecessarily frequent—doses, or of the selection of improper preparations. Such, however, as are soluble in water with difficulty ought not to be used, for it may happen that, having been inert for some time, a large amount may enter the circulation at once. Particularly is this true of digitalin, which is by no means a soluble alkaloid, but a crystallizable glucoside of uncertain strength. The digitalins of different manufacturers yield widely differing results; the majority require immense doses compared with the dictates of the books in order to exhibit a perceptible effect. I use the infusion, the tincture, the fluid extract, and the solid extract. Their relative values I do not desire to discuss, except in regard to their advisability in phthisis, and the possibility of continuing them for a long time. Patients of that class we see from time to time only; they require advice and prescription for protracted periods. As a rule their digestive organs are amongst the first to suffer; indeed, many an alleged dyspeptic patient is afflicted with gastric disturbances first, and has his attention drawn to the lungs by his physician, who discovers the cause of his gastric catarrh in the retarded circulation of heart and lungs.

"In such a case the stomach exhibits the peripherous symptoms of the distant diseased organs in the same manner that a local disease of the brain or cord shows itself first in affections of peripherous nerves. Now, whenever the stomach is first affected neither the tincture nor the infusion is tolerated long. The latter, the officinal preparation, may be given three times daily in doses of half a tablespoonful each, or in two of three teaspoonfuls each, for some time; but I seldom wish to recommend it for more than four or five days in succession without seeing the patient. The fluid extract has often disappointed me; I cannot tell why, nor do I claim to know why. [That is what I said sixteen years ago; I can now say after daily observation extending over many years, I have learned to rely on Squibb's and some other fluid extracts.] My main reliance is on the solid extract and my almost universal method of giving it is in the form of a pill, in such combinations as will suit the individual case. The stomach does not object to it and taste is not offended by it. I often prescribe 1½ to 1¾ grains, corresponding to three and a half times its weight of digitalis, for weeks without expecting to see the case again. It combines with extract of nux vomica, with iron, with arsenic, with extract of belladonna, or extract of physostigma (Calabar bean), with ext. coloc. compound—in fact, with anything. Such combinations are frequently required in the early stages of consumption. The general muscular system needs toning up, the intestinal muscle requires strengthening, the intestinal tract evacuation, the intestinal and abdominal circulation easing. At the same time, iron may be added when there is no fever; or caffeine for its stimulant effect upon the heart and arteries."

Speaking as a general practitioner before a meeting composed almost exclusively of general practitioners, I desire to add in this connection a single remark on the general usefulness of digitalis in other cases. Every chronic disease and the results of the wear and tear of what is called civilized life have a depressing influence on all parts of the organism. The heart is not the last

[1] Therapie der Gegenwart, 1900, No. 1.

to suffer. Its muscular strength is tasked every second; it is the very organ that cannot and must not rest. Stagnation in an outlying province will overexert it; ill nutrition of the nerves will influence it, general anemia exhaust it, infection paralyze it, weak circulation or venous obstruction interfere with its structure and strength.

Now, what alcohol and ether are to the nerves, strychnine to the muscles in general, digitalis is to the heart, except in a condition of acute myocarditis. The increase of arterial pressure which it produces is beneficial not only to the outlying provinces, but also to the circulation and nutrition of the heart muscle itself. Thus, in all cases of general anemia, in slow convalescence where iron and nux vomica are called for, digitalis is likewise required. It strengthens the heart, propels the blood stagnating in its own fibers, and shortens the period of recovery. I have learned to look upon digitalis for restoring vigor and strength as of more than mere symptomatic value; I consider it one of the best tonics, along with iron, nux and arsenic, when given in small doses persistently.

The main effect of digitalis is the increase of cardiac contraction and of the volume of the pulse. Both are, according to Schmiedeberg, caused by the improved elasticity of the heart muscle and its more intense shortening during systole. The concomitant result is an improved action in diastole, for a heart that is thoroughly emptied during systole is better qualified to aspirate a new supply. The retardation of the heartbeat resulting from the stimulation of the pneumogastric nerve through the action of digitalis allows opportunity for the complete emptying of the ventricle with consecutive improved aspiration; in other words, the arterial blood-pressure and circulation are increased and afford the veins ample opportunity to discharge their contents. That is the effect of large doses of digitalis given once or oftener. To give big doses too often may lead to the exhibition of one or more of its bad effects, the so-called cumulation. Large doses, however, are not required for long, but many cardiac diseases demand moderate doses for moderate effect; more still require a persistent effect for the symptoms caused by anatomical lesions which cannot be removed. It is these that cause a persistent moderate incompetency of the action of the heart, which can be dealt with only by just as persistent moderate doses of the proper remedy. Years of cardiac ailment should be met by years of cardiac medication. This is intelligible to those who will be good enough to consider that insufficient metabolism and the hunger of the tissues can be treated only by persistent feeding, say three or four times daily, and not by the pouring in of a dozen beefsteaks at a time with fasting afterward.

The small doses which I recommend as the regular daily measure have only a moderate action on the blood-vessels. That is important to know, because large doses may contract the small arteries to such an extent as to increase the labor the heart has to undergo to overcome the increased peripheral resistance.

The indications for the use of digitalis according to the methods just indicated are the insufficiency of the heart muscle and the incompetency of the mitral valve. Chronic myocarditis is no contra-indication. Large doses may overexert the inflamed muscle; that is why digitalis in large doses is very badly borne in *acute* myocarditis; small ones are often serviceable when the first onset is passed. Aortic insufficiency has been declared a contra-indication to digitalis by some, an indication by others. I feel certain that these observers had different cases to deal with. Aortic insufficiency, when incipient or moderate, is easily compensated, gives no uneasiness to the patient, is not complained of, and is seldom observed when recent. This is the time when such doses of digitalis continued a long time prove of permanent service. Only those, however, can be thus benefited whose cases are recognized early, either accidentally or through careful self-observation by the patient. When, however, the case is old and compensation greatly disturbed, with considerable peripheral venous obstruction, even digitalis will not suffice to restore the equilibrium between the action of the heart and the capillary circulation of distant organs.

A last word on one form of incompetent metabolism with which we frequently have dealings, namely, chlorosis. I never treat it without adding digitalis to the iron and the mild vegetable purgative the patient is to take. Its influence on the circulation of the body in general and the heart vessels in particular is such as to improve general and local nutrition for reasons detailed before. All forms of chlorosis are benefited by it, the common as well as the severe form pictured by Virchow and Germain Sée. In this, while the heart may be normal in size but is generally of feeble structure, the arteries are small and do not provide for a sufficient organic nutrition. It will be easily perceived how the action of digitalis in small doses, persistently given, cannot help but be beneficial.

HEART STRAIN: ITS RESULT AND TREATMENT.[1]

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THE study of heart strain and cardiac conditions referred to heart stress is of comparatively recent date. British surgeons serving in India discovered that dilatation often occurred among soldiers, and Watson, in his lectures, expressed the opinion that it is more common in civil life than was usually supposed; but it was not until later that mechanical strain was recognized as a cause. As late as 1871 Allbutt made the remark that "mechanical causation of heart disease is either omitted, or is treated in a way so meager

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as to be worthless, by the European and foreign writers."

The first studies in this direction reported in the United States, so far as I am aware, were made during the war of 1861-65. Dr. M. R. Taylor sent a synopsis of some investigations made by himself in this field to the Surgeon-General's Office in 1864, and reported them to the American Medical Association in 1867. Dr. J. M. Da Costa reported the result of his investigations to the Sanitary Commission in 1867, and published it in the *American Journal of the Medical Sciences* in 1871. In the same year, 1871, Meyers, of the Coldstream Guards, wrote of the frequency of heart strain in the British army. In 1873 Fräntzel gave the results of his observations in the Franco-Prussian war. Since that time much attention has been given to the subject. One of the most earnest and careful investigators of this condition in civil life is Dr. Allbutt of Leeds, England.

A study of the literature of cardiac disease shows that the first attention given to this subject was due to the occurrence of sudden dilatation in army life. That sudden dilatation may occur has been recognized by Claude Bernard, Osler, Fothergill, Goodheart and many others. Dr. Gairdner suggests that if we place the finger over the apex where the impulse is felt most distinctly, then lean forward to a stooping position and hold the breath about one-half the expiratory interval, and continue this as long as possible, the impulse will gradually vanish as the distention of the right ventricle goes on until it is finally lost. Prof. Wyman makes the following report of experimental studies: He says: "I took a medium-sized dog, opened his chest after making tracheotomy, noted the action of the heart and the relative size of the two ventricles. Then I put the nozzle of a strong bellows into the trachea and distended the lungs with air. Under the pressure thus induced in the air-cells, the enveloping capillaries were elongated and the blood was dammed up in the pulmonary artery and the right side of the heart, distending the right ventricle to a remarkable degree. I found that an increase of pressure in the air-cells produced proportionate increase of pressure in the right ventricle. Subsequent repetitions on other animals showed that a peculiar pallor would appear in the tongue and membrane of the mouth when the right side of the heart was overdistended. Then in another trial I distended the pulmonary air-cells by placing a dog in a box while the air-pressure around the body inside the box was lowered three inches, as measured by barometer. Pallor of the tongue was again noted, and after the animal was taken from the box locomotion was performed with great difficulty; for days subsequently the exertion consequent upon a scramble for food would provoke dyspnea."

The suggestion of Dr. Gairdner and the experiment of Prof. Wyman point to the fact that dilatation of the right ventricle is the result of sudden interference with the circulation, or increase of blood-pressure. The condition, then, of heart strain originates in a forcible dilatation of the heart by blood-pressure from within. The damage, however, falls chiefly on the ventricles. This may occur suddenly, under great physical stress, or more slowly from causes less pronounced, but acting through a greater period of time. The right ventricle is most frequently affected. Dilatation of the left ventricle must be attributed to causes more remote, such as obstruction to the passage of blood through the arterioles of the general circulation, caused by muscular pressure, the elasticity of the larger arteries meanwhile easing the strain of the muscles appertaining to the heart. Shock is thereby lessened and the dilatation more gradual (Allbutt).

The effect of heart strain may best be understood by calling attention to the condition of the heart under normal circumstances. It is the function of the heart to carry on the circulation. Its work consists in moving a column of blood equal to about $^1/_{13}$ of the weight of the human body. Under normal conditions in a man weighing 156 pounds, this requires that the heart shall keep in motion a column of blood weighing in the neighborhood of twelve pounds. In each individual the heart is adjusted to the work to be done, so that an equilibrium may be maintained. This equilibrium may be disturbed to a degree and the natural recuperative power enables the heart to resume its normal condition; but if this disturbance continues by overwhelming efforts, or by continued effort in slighter degree, eventually the equilibrium may be destroyed and disease result. Muscular action increases the blood-pressure. Extraordinary effort, and even ordinary effort continued, may increase blood-pressure. If the heart is not overworked, that is, if only such effort is made as the heart is able to maintain without disturbing its equilibrium permanently, a degree of work is beneficial and will keep the system in a more healthful condition. But if extraordinary effort, either sudden or prolonged, is made, or if any other resistance to the peripheral circulation exists, as diseased arteries, or cirrhosis of the kidneys, lungs or liver, the blood-pressure is increased, the strain upon the heart is augmented, and the results of such strain must follow. These results are, in case of sudden and violent strain, engorgement of the right ventricle with blood and rapid dilatation. In the case of less pronounced blood-pressure dilatation will follow more slowly, but none the less surely.

The effect of heart strain, then, is seen in two ways, (1) by overwhelming disturbance, causing immediate faintness, possibly paralysis and death; (2) a more gradual dilatation from lighter and daily strain. When the shock does not terminate in the death of the individual at once the normal irritability of the heart is in a great measure lost. The heart muscles are in the condition of muscles in any other part of the body when the fibrils become unduly stretched and strained;

the rhythmic action becomes feeble, tremulous and imperfect. In the case of the heart the condition is one of profound asthenia; it is possible, even in this instance, for the effects of strain to be removed, and if the heart has the opportunity to rest under proper treatment it may recover its normal size in a short time, but its rhythm of action may be destroyed for weeks or months. If the strain is not sufficient to produce at once such destructive results, the changes, although less pronounced, may still be damaging. The functional disturbances of the organ are but expressions of the damage it has received. When the condition has existed until the second stage has been reached it is seen either as simple dilatation or dilatation with some hypertrophy. Later there may be dilatation with decided hypertrophy, or there may be hypertrophy without dilatation, the cavities retaining very nearly their normal size.

There are two periods of greatest danger; one is at night, during those hours when the periodical distress returns and when respiratory movements are most sluggish; the other is when, upon rising from a recumbent position, the column of blood in the upper part of the body is suddenly thrown back upon the enfeebled ventricles, thus at the same time diminishing the brain pressure.

When the arterial tension is already high it is increased relatively more by whatever tends to raise the blood-pressure. That mechanical stress or strain is an important element in the case of disease of the heart, no one of great experience can doubt. Most cases of certain diseases of the heart—hypertrophy, dilatation or valvular lesions—occur in those who have been subject to strain, such as hard manual labor, army life, athletic sports, football, bicycle-riding, high arterial pressure and the like. This is nothing less than should be expected in view of our knowledge of the circulation of the blood and the structure of the vascular system.

Reference has been made to the equilibrium of circulation. The circulation is oscillating and exhibits a certain variation of pressure under normal conditions, due in part to the natural elasticity of the vessels and in part to changes in muscular contraction. Injury is done to the heart whenever resistance is excessive, as muscular effort with a tight belt or casing surrounding the body, and even when slightly above normal for the individual, but continuous in rigid vessels, as in those of advancing years. Resistance to the heart's action and a degree of strain occur in cases of cirrhosis of the lungs, liver and kidneys, or mechanical effort continuously above what the elasticity of the vessels or the natural strength of the heart muscles can easily overcome. Dr. George Oliver asserts that observations with the pulse-pressure gauge have shown that when other indications are favorable the lower ranges of pressure are not only more salutary, but are very often compatible with the highest degree of health. The increase of blood-pressure caused by sudden and severe resistance is not characteristic of habitual muscle exercise and, indeed, later tends to reduce the mean arterial tension (Allbutt).

Persons who lead sedentary lives are more liable to heart strain than those whose lives are accustomed to habitual exercise. One who lifts a heavy weight occasionally is more liable to disease than one who does it continuously; but, if a continuous exertion is in excess of that to which the heart and arteries may easily adjust themselves, harm may result. Many of these cases occur in retired life. A man who has given up business and travels for pleasure often upon climbing a mountain or taking active exercise becomes faint or short of breath. The sudden compression of the blood-vessels by the muscles which are required to contract beyond their custom raises the blood-pressure sometimes to such a degree as to rupture a limb of the aortic valve. If no damage occurs at first, however, one may become accustomed to such exercise and rather improve under it. "Dr. Weber, during an ascent at the beginning of his holiday, stated the rise of pulse-rate to be 74 to 122, and after a week's active walking the rise was from 74 to 105."

According to Allbutt, dilatation of the right side of the heart is an early symptom of prolonged exertion, but sudden strains affect the aortic area. Other authors, as Barr and Oertel, affirm the same. Physiologists tell us that there is an initial rise of pressure in prolonged exertion, such as running, rowing, cycling, ball-playing and the like. The blood is not driven out of the heart at each contraction, hence slow dilatation occurs. The heart may adjust itself to the increased pressure. It is this condition which occurs in what is called getting the second breath, or "second wind." Accumulation of waste products occurring in the blood in cases of severe exercise may have some effect in producing stress of heart directly or indirectly (Allbutt). The physician will often suffer from such condition. Called suddenly in the night or at other times, in emergency cases, he frequently runs to the patient or to a train; when he reaches the spot he is profusely perspiring, short of breath, almost or quite faint, perhaps sick at the stomach; the face is cold; pulse rapid, small, of low pressure; examination will probably show an increase of cardiac dulness; the cardiac area is enlarged. If the patient is not too far along in years the dulness subsides after rest. If he is past middle life the pulse may become irregular and intermittent, and albuminuria may follow in the milder cases. In more acute cases pain and constriction are felt in the region of the heart, rarely in the arms. The pain may sometimes extend as far as the second interspace. There may be dyspnea, yawning, exhaustion, cold sweat on the forehead; the pulse may be irregular in force and rate and intermittent, the right ventricle enlarged. When blood-vessels are rigid, as in the aged, the danger is greater.

It was formerly supposed that heart strain

was confined to the profession of arms. The compression of belts and accoutrements seems to interfere with the natural elasticity and movement of the heart in its function of expanding to relieve the increase of blood pressure under strain, and it may precipitate trouble under physical efforts which the patient might perform ordinarily with ease. When at rest he feels fairly well. There is no distress, no throbbing in the chest. As soon as he puts on his accoutrements and begins drill everything is changed. The heart throbs more or less violently. A feeling of oppression with a difficulty of breathing is experienced, and a sensation of weakness, sickness or dizziness follows, and he may be compelled to fall out of the ranks. I saw such cases during my own military experience in the Civil War, but I was not then a physician and was unable to profit by that experience. The sensation, however, I understand, for I was one of the victims of the condition. We had been marching for some hours, and just before reaching camp we were urged to a more rapid step. As we ascended a hill I was made conscious that something was wrong; the heart began to beat hard, I grew faint, sick, dizzy and fell at the side of the road. I lost consciousness only a moment, but was not fit for duty until the next morning. At first the condition is only functional, the soldier being able to resume his duties after a brief rest. It is fortunate if the strain is not brought on again. I was soon transferred to a position where most of my duties were performed on horseback, and my heart trouble ended.

Where the duties remain hard or care is not exercised, the symptoms remain and the conditions grow worse. In acute cases the symptoms are almost uniformly described as, first, a flush of the face, particularly the cheeks, chin, nose and ears, and deepened color of the lips; the veins of the neck become turgid and the respiratory movements are limited to the upper portion of the thorax; very soon respiration becomes labored, breathing short; there is profuse sweating, a deathly pallor and great weakness rapidly succeed, and, unless caught, the man falls to the ground.

My observations of heart strain and its results have been confined chiefly to athletes, baseball and football players, cyclists and soldiers of the Civil War, Spanish-American and Philippine Wars, and soldiers from the regular army. I have seen a few cases among boys, laboring men and travelers. The milder or slower form, resulting from slower processes, is very common among laborers, porters, hod-carriers and others engaged in employment where sudden and powerful effort is occasionally required, or prolonged effort (though of less pronounced character) is sustained.

One of the most marked cases of sudden heart strain occurring in my practice was the following, which occurred five years ago. Mr. A., proprietor of a livery stable, directed his men one day to lift a heavy wagon and move it to one side. The efforts were not satisfactory, and he impulsively took hold of the load and lifted beyond his strength. He was seized with faintness and fell to the ground. I was summoned at once and attended him at his home two blocks away, where he had been carried. I found that the first symptoms were those of acute heart strain, but there were in addition those of ruptured valve. He had great pain and difficulty in breathing; the heart action was slow and irregular; the valvular flapping sound at the aortic opening pointed to rupture. He informed me that he heard "something snap" in the region of the heart when he lifted the wagon. The cardiac area of dulness was large, but gradually subsided to smaller dimensions, as the patient recovered. The symptoms gradually declined, and in a few days he was able to resume the lighter duties of his occupation, but it was some weeks before the sounds and the condition of the heart returned to their apparent former status. As the patient had a valvular murmur prior to the accident it was not possible to determine how much permanent damage resulted from the strain. Dilatation, however, still exists, and is likely to become more troublesome as life advances.

There are many of those cases among boys and young men given to hard exertion in games. One such I mention as typical of many. Last fall I attended a young man who had overdone a great many times. I saw him once after a hard run. At first the face was flushed, the body covered with red and whitish areas; the heart was beating violently, and the breathing was difficult; blood-pressure was low; the cardiac area increased; the right ventricle dilated. The patient grew faint, became pale, slight nausea came on, but after a few minutes recovery rapidly succeeded. I have seen him in three of these paroxysms. The heart is not permanently impaired, and he may remain well, as he has promised to forego such hard exercise.

Allbutt reports the following case: "A man of letters, whose constitution had been shaken by profuse hemorrhage in early life, took to the bicycle in middle age, and often rode hard and far. He complained to me that at times he felt some discomfort from it. On careful examination I found no sign of disorder, but I begged him to end his next hard ride at my house. He did so, and I then found his heart irregular and intermittent, the arterial pressure low, and the right ventricle dilated. Fortunately, on his next visit he was well again, but repentant."

Such paroxysms in the middle-aged pass off more slowly, and with greater difficulty; in fact, the damage is more likely to persist in proportion to the patient's years. The pulse may remain irregular and feeble for a long time, and the breathing become embarrassed by the least effort.

In a series of examinations of some 700 ex-soldiers I have been interested in observing the large number suffering from some form of cardiac disease, most of which can be explained by reference to heart strain. These morbid conditions may frequently be observed in those who

were in the Spanish-American War; already some of them are showing signs of hypertrophy, dilatation, and excessive cardiac irritability. We are assured by surgeons of the British army that high temperature increases the liability to heart strain. With this in view I have thought that the sudden transfer of our troops from Northern soil to a hot and depressing climate has had something to do with the frequent occurrence of this condition amongst those who served in Cuba during the late war. The same observations may apply to those serving in the Philippines. Many of these soldiers were clerks or office men unaccustomed to hard work or heavy strains. The digging of trenches or going on forced marches with their tight belts and heavy accoutrements under the rays of the hot Southern sun suddenly overcame many of them, and in others initiated troubles which will finally drag them to their graves. What these troubles may be is illustrated in the cases of the pensioners of the Civil War. The greater number of these veterans, perhaps, are suffering from some form of heart lesion due to overstrain of the organ caused by the duties of their army experience. These conditions to-day are chiefly dilatation with or without hypertrophy, and sometimes valvular lesions; rigidity of the arteries is a frequent complication and one of fatal significance. If compensation has not been ruptured, if hypertrophy is still maintained in sufficient degree to keep the circulation in equilibrium, and if the arteries are in a fairly healthy condition, life may be prolonged for many years. If, however, equilibrium is not sustained, if dilatation is gaining and hypertrophy is losing, if compensation is failing, breathing becoming more difficult and exercise a task, dropsies come on and progress toward the grave is more or less rapid.

The study of these cases is interesting. Among pensioners all varieties and stages of the affection exist. Often all the distress is located in the stomach, a slight indigestion, and all the general appearance and bearing of the patient is such as to lead one to suspect gastric or intestinal disturbance or engorgement of the liver or spleen, without cardiac complications. He may not know that he has heart trouble. When asked about the short breathing he says that it came on gradually. Persistent inquiry, however, will often elicit the statement that at some time an accident occurred, or an effort was made, which will point to the origin of the ailment. Often, again, he will indicate the time clearly, but stating that faintness came on after drill, a march or exercise, but soon passed off. Sometimes there is vertigo and, perhaps, distress in the chest, particularly at night, and this is often accompanied by a smothering sensation, dyspnea.

The study of the pulse is interesting and instructive, but the sphygmographic tracings are not always satisfactory. In the first stage the pulse is weak. In the second it may be full and frequent and hastened by exercise: it is irregular or variable or jerky, intermittent and generally dicrotic. If the strain has been felt on the right side of the heart, chiefly, little is indicated by the pulse, except cardiac asthenia. In these patients we often see tremulous movements in the costal margins, or in the sixth or seventh intercostal spaces, which are easily felt by palpation. They are likely to be present in dilatation of the right ventricle, while they may be present in dilatation of the left.

Auscultation in the first stage is not always satisfactory, no signs being indicated except those of asthenia. In this stage there are no valvular lesions, no bruits nor murmurs, except in severe cases where a limb of a valve is ruptured. In the ordinary cases these signs are absent. It is often just as difficult to get a tracing of the radial pulse. It is only after the heart has passed beyond this stage that evidence of organic mischief is present. The systole then becomes very short. The heart contraction is reduced to half the usual time, the time between the first and second sounds is lessened, but a prolongation of the diastolic interval may be observed. The rhythmic movements may vary from 45 a minute in the recumbent position to 150 in the standing position or during moderate exercise.

Over the region where the tremulous movements are seen in later cases there will be heard a loud, rough, systolic sound of low pitch. If compared with the normal ventricular sounds of the left side, the difference may range anywhere from a half to a full tone in the diatonic scale. As a rule, it is heard loudest between half an inch of the left of the costal margin opposite and a little below its junction with the sternum; and again very distinctly anywhere on a horizontal line extending from, and to the right of, the apex (Taylor).

In cases of recovery where the cavity of the right ventricle has almost reached its normal size, this rough sound gradually passes away, so that it may not be observed until the cardiac movements have been extended by exercise, then the pitch will be higher. Should dilatation remain with or without hypertrophy, the rough sound retains its low pitch. If the hypertrophy diminishes the size of the cavity to nearly its normal state, the pitch becomes so nearly like that of the opposite side that it is no longer distinctive. Occasionally pulmonary accentuation is present, especially if the cardiac lesion originated in respiratory trouble. In such conditions of the heart there is more or less venous stasis, circulation in the extremities is feeble, hands and feet may be cold and the color, disappearing under pressure, returns slowly. I have lately seen a case in which there was such general turgescence of the veins of the chest and abdomen that there was a red blush over the entire surface, leaving a white mark upon stroke similar to that characteristic of certain cases of exanthematous rash. In such cases the lips will range in color from a cherry red to a livid hue.

One of the most interesting cases among ex-soldiers that I have examined is the following: During the Civil War the patient had typhoid

fever of medium severity. After convalescence and returning to his company, the command was sent upon a long march. He was overcome by the exertion and heat, became faint and exhausted and fell out of the ranks. He was carried in an ambulance to the camp and recovered in a few hours. Several times afterward he had a similar experience, and always since has had more or less trouble with his heart. At the present time the cardiac area is increased about 20 per cent. There is mitral, tricuspid, and aortic regurgitation accompanied by hypertrophic dilatation. Tremor of the chest-wall involves the entire thorax and extends throughout the body, the pulse thrill being especially observed in the arms. A confusion of sounds exists, a rushing, rasping, blowing over the entire area of the heart, especially marked over the right ventricle, over the apex, and at the right and left second interspaces. It is difficult to separate the sounds. The pulse is visible on both radial and ulnar sides of the wrist. The radial pulse is variable, full, vanishing, irregular, intermittent, with a peculiar tracing. The up stroke or ascent of the sphygmogram is quick and nearly vertical. The apex is a plateau. The down-stroke is characterized by a vibratile motion, but it is unbroken by the recoil or dicrotic wave. It is the sphygmogram of high tension, aortic, and mitral regurgitation. It seems strange that one in such a condition can engage in the ordinary duties of life, yet this pensioner is able to move about at will and does light office work, but he is unable to perform any manual labor. He suffers from frequent attacks of dizziness. Fortunately, compensation has not failed.

Treatment.—The treatment should be prophylactic, hygienic, dietetic and medicinal. Prophylactic treatment in civil life would require elimination of corsets and belts from ordinary dress; a quiet, well-regulated life, avoiding overexertion or any exercise that would produce a profound impression upon the heart. In military life it requires such an adjustment of accoutrements and exercise as will prevent overwhelming the heart in its efforts to carry on the circulation. The proper advice to such persons is to leave the service.

Hygienic treatment involves a well-regulated exercise, fresh air and sunshine, a well-ordered life and avoidance of excesses in any direction, systematic bathing of such temperature and character as will not produce shock, regular meals and sufficient sleep, the avoidance of all dissipation.

Dietetic treatment is particularly needful in advanced cases. All forms of food which have a tendency to the production of gas in the stomach or intestines, and all classes of food which produce digestive disturbances of any kind should be prohibited. The interval between meals should be of sufficient length to permit the complete digestion of one meal before another is taken. In mild and initial cases no change in the diet may be required. Where the work of the heart is excessive, liquids should be limited. Even a small amount of liquid beyond the necessities of the system may work damage by overtaxing the heart.

If blood-pressure is low, liquids should be administered to lessen resistance and increase elimination. Hence, the condition of the pulse tension, the force of the heart's action, and the quantity of urine will serve as guides to the amount of liquid required. Hot water acts as a stimulant in cases of cardiac diseases resulting from strain, and not only washes out the stomach after digestion, but strengthens a flagging heart.

In cardiac asthenia when dilatation is present a dry diet is indicated. It lessens the work of the heart. If the kidney is not involved a nitrogenous diet should be prescribed, as milk, the pulses, eggs and meat, gluten bread, almond meal, etc. If the disease is not of a severe type, other vegetables, such as onions, asparagus, lettuce and tomatoes may be allowed. Supper should be the lightest meal of the day. If patients are thirsty when on a dry diet, hot water may be taken between meals. Sometimes milk and lime-water, lemon-water, or a weak solution of phosphoric acid, will afford relief and may be given. Toast, nut-foods, nuts and fruits often act well. Like dry foods they should be thoroughly masticated. If compensation is failing and digestion is disturbed, the chief reliance is in liquid nourishment. The feedings should be small in amount and frequently repeated. Rest in bed is essential. Sudden dilatation requires rest in bed and a milk diet. Hypertrophy may require rest in bed and a non-stimulating diet. Well-cooked fruits may be given. The bowels must be kept open. If hypertrophic congestion of the liver occurs, some depletion may be required and a diet of milk or whey and soda and lime-water administered.

Before medicinal treatment is begun the cause should be removed if possible. In the first stages little, if anything, more than such management as has already been suggested will be required. In cases, however, where asthenia is present, digitalis and strychnine are the most important remedies; the addition of tonics will restore the tone of the heart and reduce its rhythmic activity. The duration of the treatment must be determined by the condition of the individual case. It will depend, somewhat, upon how the organ responds to the treatment; but so long as dilatation exists they cannot safely be stopped. If for any reason, however, these agents do not act well, some substitute for them must be found. There are two substitutes for digitalis which may be used alternately with that remedy, or in place of it, as circumstances may demand; these remedies are convallaria, strophanthus, and in some cases caffeine. Sometimes it may be found necessary to substitute nux vomica and other tonics for strychnine, but I have found that in most cases strychnine may be given, though occasionally small doses may be required. For hypertrophic overaction aconite is often useful, but it should be used with great caution. Gelsemium and aconite are sometimes required as cardiac sedatives. For distress at night, belladonna, hyoscyamus and can-

nabis indica are valuable remedies. Occasionally bromide of potassium or bromide of sodium and codeine may be required, though usually it is better not to use these preparations nor opium. Tonics and digestants may be of service in some cases. The treatment is that usually required in such cardiac conditions. Complications may necessitate a modification of treatment.

ON THE ACTION OF DIGITALIS.

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AT THE end of the eighteenth century two important innovations were introduced into medicine by physicians practising in two neighboring counties of the west of England, the digitalis treatment of dropsy by Withering of Birmingham in 1785, and vaccination by Jenner of Gloucester in 1798. The sponsors of these methods derived their ideas from the same source, the popular medicine of the locality, and each worked in silence on his topic for many years before venturing to lay it before the medical profession.

The importance of Jenner's discovery has given his name a world-wide fame, but is it just that that of Withering should be known only to a few students? In his treatise on the subject he states that digitalis had been used by himself and his friends for ten years and gives the histories of over two hundred cases. He failed to recognize that digitalis acts chiefly on the heart, but differentiated between true dropsy and what appear to have been cases of ovarian cyst and states that in the latter digitalis produces little or no amelioration. After the appearance of Withering's paper, digitalis seems to have attained immediate popularity, though its position was afterward endangered by use in many forms of disease in which it could have been of no benefit. In 1830 it was generally recognized that its chief usefulness lay in the sphere of cardiac disease and soon afterward the first experiments were made on animals in order to ascertain its action on the circulation (Blake, 1839). A more serious attempt to elucidate its action was begun by Traube in 1851, and since then it has formed the subject of a large number of investigations.[1] Of late years more accurate methods of investigation than were at the disposal of the earlier workers have thrown much light on the action of digitalis; but before these are considered it may be well to discuss what are the active principles of the drug. Schmiedeberg in 1882 found three bodies in digitalis which acted in the same way on the heart and which he named *digitoxin*, *digitalin* and *digitalein*. These were accompanied by other inactive bodies, the chief of which he named *digitonin*. More recently Kiliani has confirmed Schmiedeberg's findings and added another glucoside, *digitophyllin*, which resembles digitoxin in many features. All of these he showed to belong to the group of glucosides, and all of them are contained in the ordinary preparations of digitalis.

For nearly forty years after Traube's first experiments the only method employed in the examination of the effects of digitalis on mammals was the registration of the blood-pressure by means of the mercury manometer. This however does not permit a sufficient analysis of the changes in the heart; and although it was supplemented by direct examination of the frog's heart and by the registration of its movements under digitalis, it was felt that no direct inferences could be drawn as to the changes induced in the human heart. As a matter of fact, the reaction of the cardiac muscles in the frog under digitalis differs in some essential features from that of the mammal, and I shall therefore pass over the results of these experiments. The experiments performed on mammals with quantities of digitalis equivalent to those used in therapeutics showed two chief features, (1) the slowing of the pulse, (2) the rise in the blood-pressure. The slowed pulse is due to increased activity of the cardiac inhibitory apparatus, chiefly of the inhibitory center in the medulla oblongata. The increased blood-pressure is due in part to an increase in the amount of blood expelled by the heart, in part to contraction of the peripheral vessels, which increases the resistance to the current of blood from the larger arteries to the capillaries. It was further shown that the pulmonary vessels are much less affected than the systemic arteries; in fact, it may be questioned whether digitalis induces any contraction of the pulmonary arterioles.

During the last ten years, efforts have been made to obtain a deeper insight into the changes in the heart under digitalis, and it is gratifying to find that the most diverse methods of examination have given results which are in complete accord as regards all important features. These experiments vindicate for digitalis and its allies an action on the heart which is altogether different from that obtained by means of any other drug used in therapeutics. The slow pulse and the increase in blood-pressure which were observed by the manometric experiments are, on the other hand, induced by many other drugs, such as strychnine and often caffeine. The administration of therapeutic doses of digitalis to animals was found to be followed by slowing of the heart, an increase in the strength of its contractions and an increase in the dilatation. The slowness of the pulse is due to the heart's spending a longer time in rest between the contractions, or, as it is generally stated, to a prolongation of the diastolic pause. This slow pulse is not due to any direct action on the cardiac muscle fibers, for it disappears when the inhibitory mechanism is paralyzed by the injection of atropine. It proves, as has been already stated, to be due for the most part to stimulation of the inhibitory center in the medulla oblongata.

[1] For the bibliography of these see a paper by the author in the Jour. of Exp. Med., II., p. 233, 1897.

The increase in the dilatation of the heart, that is, of the relaxation of the muscle fibers, leads to the heart attaining a larger size in diastole than before the drug was administered; the heart therefore allows more blood to enter its cavities than before. This feature is less constant than are the others, and in my experiments it appeared to be more marked in hearts that were normal to begin with than in those that were already dilated before the drug was injected. The increased dilatation, like the slowing of the beat, proved to be due to inhibitory action and not to any direct action on the cardiac muscle. When the inhibition was removed by atropine, the heart resumed its normal rate of beat, or a faster one, and the relaxation of the muscles was the same as, or less than, that before the injection. The only marked feature that remained was the increase in the strength of contraction, which has thus a different origin from the slowing of the heart and increased dilatation, and which must in fact be referred to a change effected in the cardiac muscle itself. This increase in the strength of contraction naturally resulted in the heart attaining a smaller size at the end of systole than before the drug was administered; in other words, there was less blood remaining in the ventricle at the end of systole. It is now generally recognized that the ventricle does not empty itself completely at each stroke; there is always a smaller or larger amount of blood remaining over after the contraction, and before the inflow from the auricle begins. This action of digitalis is not confined to the ventricle, but extends to the auricle, and both right and left hearts undergo the same changes in rate, strength and dilatation. Roy and Adami pointed out, before my experiments began, that the papillary muscles are also involved and contract more strongly than before; in fact in some of their work the changes in the papillary muscles were much more marked than those in the ventricular walls proper. The greater strength of the contraction of the walls naturally leads to an augmented pressure in the interior, which has been demonstrated experimentally by Kaufmann, Rolleston and others.

The heart may be regarded as a complicated pump and its state of efficiency may be measured in the same way as that of a mechanical pump by the discharge per minute. Now, the experiments just detailed showed that the ventricle contained more blood at the beginning of its contraction and less at the end under digitalis than in normal conditions. Each stroke of the pump thus expelled more fluid than before; but there were fewer strokes per minute and it thus appeared possible that, although the contractions were stronger, the actual efficiency as measured by the output per minute might be lessened. As a matter of fact, further experimentation convinced me that after therapeutic doses the output per minute was larger than before, the slowness of the pulse proving insufficient to counterbalance the increase in the amount discharged by each contraction. The increase in the efficiency amounted to from twenty to thirty per cent. in normal animals. When larger quantities were given and poisoning was shown by the extreme slowness of the heart, the output fell to below that observed before the drug was administered.

Further advance in the methods of experimentation in the last few years has led several independent investigators[1] to examine the effects of digitalis on the mammalian heart when isolated wholly or partially from the body. These experiments permit only the direct action on the cardiac muscle, for the inhibitory center is destroyed and the slowing and increased dilatation are therefore entirely lost. The results confirm in the most satisfactory way those which I have described as occurring in an animal with its inhibitory mechanism put out of action. The contraction of the heart is stronger, the pressure in its interior is higher and the amount expelled at each beat is larger.

Do these changes observed in the hearts of the lower mammals suffice to explain the therapeutic effects of digitalis? The most general statement of the conditions in which digitalis proves of value is a displacement of the blood. Instead of being distributed in the arteries and veins in the normal proportions, it is lodged in larger quantities in the veins, while the arteries are only partially filled and the pressure in their interior is low. To return to the analogy of the pump, the piston refuses to rise sufficiently and the water remains in the well. In order to improve the condition, the efficiency of the pump must be improved; that is, the amount of blood discharged must be augmented. And, as we have seen, this is the effect of the cardiac action of digitalis. The accumulation of the blood on the venous side of the circulation leads to starvation of the tissues of the body, manifested by degeneration in such organs as the kidney and liver and in the vascular walls, which leads to dropsy and edema. Among the organs involved in the malnutrition is the heart itself, so that a vicious circle is formed, the inefficiency of the heart leading to malnutrition and this in turn lessening the strength of the heart and increasing the inefficiency. In such a case the heart muscle becomes flabby and the cavities are dilated; the contractions are often frequent but feeble, and but little blood is expelled by each beat. The primary cause of the condition is often disease of the valves and consequent regurgitation, but even when these are sound they become involved in the general disorder; for the papillary muscles and the muscular base of the valves partake in the prevailing relaxation of the cardiac muscle and the valves are accordingly not supported against the pressure put on them in systole.

The effects of digitalis on the heart muscle are exactly those adapted to counteract this condition. The contraction is increased in strength and probably the dilatation is slightly increased in diastole, although this is much less marked in

[1] Gottlieb. Verhandlungen des XIX. Congresses für inn. Med. zu Berlin, 1901, p. 25.

the dilated heart than in a normal one. The increased contraction augments the output of the heart and raises the pressure in the arteries, thus accelerating the flow through the capillaries. The increasing pressure in the veins promotes the return of the blood to the heart and lungs, whence it again returns to the arteries. The quickened circulation supplies a more adequate supply of food and oxygen and improves the nutrition of the vessels and organs and, chief among these, of the heart itself, which becomes equal to its task of pumping the blood from the venous to the arterial side. In many cases, however, the heart is permanently injured, as when a valve is shrunken by cicatricial tissue. Here the work required is far in excess of that demanded of the normal heart, for part of the energy expended in contraction is wasted in driving the blood backward instead of forward. In such a case the heart muscle has a special burden to carry in order to maintain the equilibrium, and, as in the case of other muscles subjected to a continual strain, it increases in bulk. The hypertrophy of a muscle can occur only when it is put in the most favorable conditions of nutrition and the hypertrophy of the heart is induced not through any direct stimulation of the growth of the muscle by digitalis, but by its nutrition being improved by the changes in the circulation, which are sufficiently explained by the increased contraction of the muscle fibers. Another explanation of the hypertrophy is based upon the inhibitory stimulation; the slowing of the heart is said to allow the organ more time for rest and reconstruction. But this seems contrary to experience in the hypertrophy of other muscles, for the blacksmith's arm is not increased in size by his giving it rest and the hardness of an athlete's muscles is only maintained by constant training. Again, it has been suggested that the inhibitory fibers are really the trophic nerves of the heart, and that the increased activity of this mechanism is sufficient to explain the hypertrophy. But apart from the doubt which may reasonably be entertained regarding any explanation based upon trophic nerves, the increased inhibitory activity is not sufficient to explain the phenomenon; for other drugs resemble digitalis in stimulating the inhibitory apparatus, while no hypertrophy results from their use. I need only cite the example of aconite, which increases the inhibition in exactly the same way as digitalis, but has no effect on the cardiac muscle in therapeutic doses. Amongst the many virtues credited to aconite, I believe hypertrophy of the heart has not been claimed hitherto, but if the hypertrophy under digitalis is due to inhibition, then aconite ought to be classed as a substitute for it.

One of the most marked features of the therapeutic action of digitalis is the slowing of the pulse. This is certainly due in large part to the stimulation of the inhibitory function and in those cases in which the frequency of the pulse is a marked symptom the inhibition may be a useful adjunct to the more essential action on the cardiac muscle. But it must be added that the slower beat is not uniformly a benefit, for the chief object of the administration of digitalis is to increase the output of the heart, and the infrequency of the contractions may sometimes almost counterbalance the greater discharge by each. The acceleration of the pulse which is so often a feature of dilatation and malnutrition is probably a manifestation of irritability of the excitomotor part of the heart. An insufficient supply of nutrition is often the cause of increased activity in other organs and the heart may well be excited to frequent contraction by the general stasis of the blood. The return to the normal rate induced in many cases by rest, when fewer claims are made on the heart, and the continuance of the normal pulse after digitalis has been discarded certainly suggest that, like the dilatation of the cavities, the rapid heart-rate in cases of inefficiency is due in large part to malnutrition. So that, although it is practically certain that the slower pulse observed when those cases are treated with digitalis is primarily due to the inhibitory stimulation, the improved nutrition of the heart must also favor a return to the normal.

In many instances of digitalis treatment, a remarkable improvement takes place in the regularity of the pulse. This has also been credited to the inhibitory stimulation, and I am not prepared to deny that this may share in the effect. But here, again, the direct cardiac action in increasing the food and oxygen supply may play a more important rôle than has generally been recognized. The most extreme form of irregularity of the heart is that known to physiologists as *delirium cordis*, which, unlike the delirium of the clinicians, is immediately fatal. In several cases Gottlieb observed this in excised mammalian hearts and was able to arrest it by digitalis. In these experiments there could be no question of inhibitory action, for the heart was severed from its nervous connections, so that the direct cardiac action alone could come into play. The nutrition was also unaffected, for the blood was not driven through the coronary arteries by the heart, but by mechanical pressure which remained constant through the experiment. The improvement must thus have been due to some unknown change in the cardiac muscle induced by digitalis. But little is known as to the cause of clinical irregularity, although some contributions to our knowledge made in the last few years indicate that it may be due either to excessive irritability of the auricle and ventricle or to the failure of these to respond to impulses emitted by the excitomotor apparatus or to failure of the last to send out a contraction impulse. Whether these different forms of irregularity are equally amenable to digitalis can be decided only by the comparison of a large number of pulse tracings before and after the administration of the remedy.

The third point at which digitalis affects the circulation is the muscular coat of the arterioles, which contract and tend to keep the blood on the arterial side instead of allowing its accumula-

tion in the great veins. This may undoubtedly aid the action on the heart in cases of cardiac inefficiency and may perhaps justify the persistent adherence of the profession to digitalis in these cases in spite of the claims of strophanthus, which is practically devoid of this vascular action. In cases in which the effects on the heart are to be elicited with as little increase in the arterial tension as is possible, strophanthus is to be preferred, however. Or, digitalis may be given with a vasodilator such as nitroglycerin. When the latter is employed, Marshall[1] advises that the first dose of digitalis precede that of nitroglycerin by several hours, as the latter acts much more rapidly and may induce a considerable fall in blood-pressure before the cardiac action of digitalis has commenced.

Digitalis is not used so frequently now as formerly in cases of internal hemorrhage, but a few lines may be devoted to this subject. The ground for this application was the contraction of the peripheral arteries, which, it was supposed, would narrow the orifice and lessen the escape of blood. But more blood is expelled from the heart than before, and more must escape through the vessels, so that, even though the ruptured vessel be narrowed, no corresponding diminution of the hemorrhage is to be anticipated.

BACTERIOLOGICAL DIAGNOSIS OF TYPHOID FEVER.

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THE methods available in the bacteriological laboratory for the establishment of the existence of any disease produced by a given micro-organism are three in number: (1) The isolation and identification of the micro-organism producing the disease; here we receive the microbe from the body of the diseased person; we isolate; we grow it upon our artificial media and subject it to the tests which shall establish its identity; (2) the application of certain staining reactions to the micro-organisms received from the diseased persons, which reactions are peculiar to these micro-organisms and shall differentiate them from all other micro-organisms; (3) the effect or reaction produced by certain body fluids of persons suffering from bacterial diseases, when these fluids in certain dilution are brought into contact with micro-organisms of the same species with which the person is infected, which micro-organisms have been artificially cultivated in the laboratory. Such a method is the Widal reaction.

It is a self-evident fact that of these three methods the first is by far the most positive and absolute, because here we take the micro-organism from the body of the diseased person; we cultivate it upon artificial media and subject it to a number of tests, the physical and chemical nature of which we in most cases clearly understand, in order to establish its identity. The chances, therefore, that we may make a mistake in regard to its identity are reduced to the very minimum and are not worth serious consideration. The second method comes next in value because of its simplicity, the ease with which it may be employed by the clinical practitioner, and its reasonable certainty. It can never, however, be considered as sure as the first method, because here we submit the organism to one kind of a test only, namely, a staining reaction. The chances, therefore, that we may make a mistake with regard to its identity are greater than in the first method, in which we employ several kinds of tests for this purpose. The third method is the most insecure of the three. This is so because we really understand very little from a scientific standpoint in regard to the ultimate factors which control these reactions. In the first place, we do not know what the substances are in these body fluids which give rise to these reactions. We say that there are such substances and we call them by certain names, but they have never been isolated; we know nothing of their ultimate chemical composition; we do not know how or whence they are produced nor the conditions, from a scientific standpoint, which limit their production on the one hand and their non-production on the other. Our entire knowledge in regard to their production is mere speculation derived from insufficient and often conflicting experimental data.

Let us now consider the application of these methods to the clinical diagnosis of typhoid fever. In this connection I purpose to invert the order in which they have been given and consider first the third method, namely, the Widal reaction, because it is the one about which I shall have the most to say and also because of its widespread use at the present time. Lest anyone should form a misconception in regard to my opinion of the value of the Widal reaction as a means for the diagnosis of typhoid fever, I want to say that I believe its value as such a means cannot be overestimated. It is nevertheless to be remembered that its true value, its great value, can only be fully appreciated when one takes into consideration the limits within which such value exists.

The Widal reaction, what is it? It is simply and solely a laboratory systemic symptom of typhoid infection. To be more explicit, it is the effect produced when the dried blood or blood-serum of a typhoid patient is brought into contact with artificially cultivated typhoid bacilli (I leave out of consideration here the fact that other substances, as well as various other body fluids of those sick with typhoid, will produce this same result). The effect thus produced is as follows: These typhoid bacilli, which exist singly in suspension in the artificial fluid media and possess motility, become, in a variable time, in greater or less number massed or clumped together and remain thus massed, losing their motility. The free organisms, those which do not mass together, if there are any, either entirely

[1] Jour. of Physiology, XXII., p. 1.

loose their motility or have it but little, if any, affected. I make this statement advisedly because it is a fact that there does not exist to-day in the minds of the best men a uniformity of opinion as to what really constitutes a Widal reaction of standard clinical value. The points of difference in the opinions of such men are as follows: (1) As to whether the free organisms, if there are any, need or need not lose their motility; (2) in regard to the degree of dilution of the blood or serum which must produce the reaction; (3) in regard to the time within which the reaction must be produced after the elements are brought together in the laboratory. There are those who tell us that in addition to the clumping the motility of all the free organisms must cease; that this result must be produced with at least a given dilution of the blood or serum, and that this must take place within a given time after the elements are brought together. On the other hand, there are those who hold that, in the very nature of things, one cannot lay down any hard and fast rules up to which this reaction must measure, in all cases, in order that it be of standard clinical value, but that there are certain limits within which the reaction may take place and yet be of standard value. These point out that the conditions in typhoid, both systemic and local, are due principally to two factors, (1) the degree of virulence of the infecting organism, and (2) the peculiar individuality and susceptibility of the infected person. These factors are, however, variable quantities. To suppose therefore that any condition, either systemic or local, must in all cases measure up to certain absolute standards in order to be of standard clinical value is illogical. In our present state of knowledge the latter view is certainly the one to be preferred.

A satisfactory conception of the clinical value of the Widal reaction, together with its correct application to individual cases, can only be obtained by a consideration of the vital factors which govern its production. These are five in number and may be considered under the following questions:

1. *What Are the Substances Which Produce These Reactions and Whence Do They Come?* The final answer to this question is very easy—we do not know. The latest and what I believe to be the best hypothesis in regard to them is as follows: These typhoid bacilli contain in their bodies, probably in their cell membranes, a peculiar albuminoid substance called the "agglutinating" or "agglutinable" substance. When these organisms enter into the human economy and the vital reaction is set up, the body by means of its cells, probably the leucocytes of the blood, produces a substance, perhaps in the nature of a ferment, called "agglutinine;" this substance, acting upon the peculiar albuminoid substance in the bodies of the organisms, produces a coagulation of the latter and causes the bacilli to clump or "agglutinate." The whole process then, is one of protection on the part of the body in answer to an existing infection. In regard to the ultimate chemical composition of these substances we know practically nothing. We do know, however, that they may be locked up with one or all of three constituents of the blood, (*a*) the fibrin or fibrinogen, (*b*) the serum-albumin, (*c*) the serum-globulin. When one or all of these substances, as the case may be, are removed from the blood, it loses its power to produce this phenomenon.

2. *When and Under What Conditions Are the Substances Produced and What Relation do They Bear to the Disease?* That is, (*a*) are they present early or late in the disease? (*b*) When once present do they remain present and for how long? (*c*) What relation do they bear to the immunity produced in the disease? (*d*) What relation do they bear to the virulency of the infecting bacilli and to the susceptibility of the infected individual?

a. They may be present either early or late or not until convalescence is established. Figures show that in the first week they are present in about 20 per cent. of cases; in the second week, in about 60 per cent.; in the third week, in about 80 per cent., and in the fourth week in about 90 per cent. From this the important fact follows that the demonstration of their absence on any given day proves absolutely nothing against a positive diagnosis of typhoid fever. This statement, however, needs a little qualification, which will be given later.

b. When once present they usually do remain present throughout the disease and on into convalescence, as a rule disappearing in the first weeks following recovery, but occasionally remaining for months and even years. It is perfectly possible for them to be present on any given day or succession of days and then to disappear suddenly never to return again. From these facts two important considerations follow, namely, the demonstration of their absence on any given day in a fever is not proof positive that they have not been earlier present, and it is necessary to ascertain whether or not the person has previously had typhoid in order accurately to interpret results.

c. The majority hold that they do not bear any relation to immunity, because they are often present in the early days of the disease when it is conceivable that any degree of immunity exists. There are those, among them Pfeiffer, who hold that they do bear a relation to immunity because they are present with greater frequency in the later days of the disease when some degree of immunity has been acquired. Exactly where the truth lies in this respect, it is at present impossible to say, but it does not seem probable that they are in any way related to immunity.

d. They are present in mild as well as in severe cases, in cases which recover as well as in fatal cases. The rule here is that the milder the case the less pronounced is the reaction, but there are many exceptions. Very many mild cases

give early and pronounced reactions and some severe cases give a delayed and feeble reaction or no reaction at all.

3. *What Are the Conditions, if Any, up to Which the Laboratory Organisms Employed in the Test Must Measure in Order that the Result Shall Be of Standard Clinical Value?* In regard to most of the points under this head we are to-day practically in accord. We believe that the organism should be in young culture, not over twenty-four hours old, and that it should be actively motile. Some favor ordinary nutrient bouillon as the culture medium to be employed for its growth while some prefer other media. None of the best men, so far as I know, hold that we should use very virulent micro-organisms, because there are certain substances present in non-typhoid blood which give with these markedly virulent organisms confusing reactions. There are those, however, who hold that we should use micro-organisms of a medium grade of virulence and others who claim that only greatly attenuated micro-organisms should be employed. The former tell us that if we use only greatly attenuated micro-organisms we elicit positive reactions in a greater percentage of non-typhoid cases than when we use micro-organisms of a medium grade of virulence. The latter claim that if we use only micro-organisms of a medium grade of virulence we fail to produce a positive reaction in a greater proportion of cases of genuine typhoid than when greater attenuated micro-organisms are employed; thus, the full clinical benefit of the reaction is lost. Exactly where the truth lies in this respect it is impossible with our present knowledge to say.

4. *Are the Agglutinating Substances Present in Atypical Cases of Typhoid with Equal Frequency as in Typical Cases?* We know that in cases of typhoid which come within the typical class these substances are present at some time during the disease in the vast majority of cases. Different sets of statistics vary all the way from 88 per cent. to 99 per cent. of such cases. The question here is *not*, What does the presence of these substances, in sufficient amount, mean in atypical cases? but the question is, Are they present with equal frequency in atypical and typical cases and so available for diagnostic purposes? I believe that before we can decide this question it is necesary that a considerable number of cases should be worked out along certain lines, as follows: We must show atypical cases of fever which give a positive Widal reaction in a high dilution and then either by isolating the typhoid bacillus during life or by following the case to the autopsy-table and there, by the pathological lesions or by isolating the typhoid bacillus, prove that we are dealing with typhoid infection. Literature contains comparatively few cases that have been so studied. It has been the custom in atypical cases of fever which persistently refuse to give a positive reaction to negative a diagnosis of typhoid. Whether we have been justified in so doing cannot be determined until more knowledge is obtained.

5. *Are Specific Agglutinating Substances Present in Conditions Other than Typhoid and in Normal Blood?* We know that they are. In other diseases the figures vary from 1½ per cent. to 19 per cent. The practical point, however, is that in these instances they are not present in anything like the amount in which they occur in typhoid infection, so that in order to produce a positive reaction it is necessary to use a very much lower dilution of the blood or serum. We thus produce a positive reaction in quite a percentage of other conditions when we use a 1 to 5 dilution, a less number when we use a 1 to 10 dilution, still less when we use a 1 to 15 dilution, and only very rarely when we use a 1 to 20 or 25 dilution.

In regard to the time within which the reaction must take place after the elements are brought together in the laboratory, we find that the views of the best men vary all the way from fifteen minutes to two hours. It is necessary in practice, however, to have some guide and it seems probable that thirty minutes is a safe and fair limit.

With respect to the technic of the reaction there are two points which deserve special mention.

1. *Making the Dilutions.*—Since the clinical value of this reaction is essentially one of dilution I hold that too much care cannot be taken in this respect. For this reason I personally discard the so-called dried blood method in which the degree of dilution is gauged by the shade of color produced when the dried blood and diluting fluid are brought together, one carrying in his mind's eye a different shade of color for each dilution; or the dilution is produced by adding to the drop of dried blood a certain number of drops of the diluting fluid and thoroughly mixing them together. I do not believe that with such a technic one can form any more than a very moderate opinion in regard to the degree of dilution with which he is working. This dried blood method has come into use chiefly because it was thought to be an easier clinical proposition than were the older methods of securing the serum by means of a blister or puncture. If, however, one will employ capillary tubes it will be found just as easy to collect the blood in these as it is to obtain it on a slide and let it dry. No more blood is required and the puncture does not need to be any deeper or more painful and in addition one has the satisfaction of knowing that he has the serum in a position to be used with great accuracy. In making the dilutions the most common practice is to use the looped needle, but in so doing we fall into inaccuracy. It is impossible to get off from the needle the same amount of fluid every time, so that one has a succession of drops of different sizes and the result is that the dilution is inaccurately made. By the use of the capillary pipette this error may be very largely obviated.

2. *The Avoidance of So-called Pseudo-Reactions.*—These are principally brought about by three causes: (*a*) When clumps of fibrin or for-

eign material present in the blood are brought into the presence of the micro-organisms, these attach themselves to such clumps, the appearance of an actual reaction being produced, when in reality only a pseudo-reaction has taken place. (*b*) Too many bacilli are often present in the microscopical field. They cannot move about with freedom and cause a confusing appearance. (*c*) In the bouillon culture there may be present bacilli attached together in masses; these when mixed with the serum and placed under the microscope lead us to suppose that a positive reaction has occurred. The first two of these sources of error may be practically entirely overcome if the technic with the capillary tube is employed. The chances of fibrin or foreign material being drawn up into such a tube are very few and experience shows that the number of organisms so entering is just about the number required. In regard to the third source of error, this may be very easily obviated if one will take a drop of the bouillon culture, examine it under the microscope and then, if it is found satisfactory, use this *same* drop to produce the reaction.

In considering the application of the Widal reaction to the diagnosis of typhoid fever, it is obvious that in any given case one of two results will be apparent, its absence or its presence.

1. *Its Absence.*—The absence of a positive reaction on any given day in a typical or atypical typhoid fever proves nothing against a positive diagnosis. If we can show by a sufficient number of observations that a positive reaction has never occurred, or that in the fourth or fifth week of the fever it is absent, we undoubtedly have a point of certain weight against a diagnosis of typhoid, but that such a result negatives a diagnosis of typhoid fever is absurd.

2. *Its Presence.*—We may have its presence in cases which are clinically typical or atypical of typhoid.

a. Typical Cases.—Its presence in typical cases (and by typical cases I do not mean cases which present all the typical symptoms of typhoid, but a sufficient number to be considered within the typical class) in a 1 to 10, 15 or 20 dilution probably throws enough weight on the side of typhoid fever to make a positive diagnosis justifiable.

b. Atypical Cases.—I believe that just so long as we know that there are conditions other than typhoid which give a positive reaction in a 1-10, 15, 20 or 25 dilution, we must show in atypical cases of fever a positive reaction with a dilution higher than these in order to justify a positive diagnosis of typhoid infection. If we are unable to do this and are only able to show a positive reaction in the low dilutions mentioned we must control the case by other laboratory factors in order positively to diagnose typhoid. Failing to do this we must say that a probability only of typhoid infection exists.

In regard to the second method available in the bacteriological laboratory for the establishment of the existence of any disease produced by a given micro-organism, namely, that of the staining reaction, this can be disposed of with respect to typhoid fever in one sentence. No stain has as yet been discovered which is able to differentiate the typhoid bacillus from other organisms.

We now come to the third method available for diagnostic purposes—the isolation and identification of the specific micro-organism. I do not propose to take up all the methods for isolating and identifying the typhoid bacillus. Some of these yield very good results, but others are not to be recommended because of the narrow limits within which they are applicable. I shall explain in detail only one method, the Hiss method, because of its wide range of application at all seasons of the year and because, when competently handled, it is second to none in its ability to differentiate the typhoid bacillus from all other organisms. Before considering this method it is necessary to consider briefly isolation methods in general. Isolation methods in general when applied to typhoid fever and particularly to typhoid fecal matter possess one great disadvantage. Typhoid bacilli when present in voided fecal matter remain alive only for a very short time, or if they do not perish they lose their original characteristics, so that they cannot be isolated by any method at present known. The length of time that they do remain alive or retain their original characteristics is very variable, depending no doubt upon the different nutrient conditions which surround them. This time varies in most cases from a few hours to a few days, probably nearer the former than the latter. This fact renders it necessary that fecal matter should be examined within a very short time after it has been voided by the patient and largely limits the use of all isolation methods in public laboratories where specimens are, of necessity, received under all conditions and where it is practically impossible to subject them to examination within a short time after they have been voided by the patient.

The Hiss method consists in the use of two media—one known as the "plating medium" and the other as the "tube medium." A tube of the "plating medium" is liquefied by heat and then cooled down to a temperature which will not injure the micro-organisms which are about to be introduced into it, but which still leaves the medium in a fluid state. The fecal matter, having been previously emulsified in sterile bouillon, is then introduced by means of a sterilized looped platinum needle into the fluid "plating medium" and by a twisting motion of tube equally distributed throughout it. Dilutions are then made from this tube into other tubes of the "plating medium," which has been previously fluidified by transferring a small portion from tube No. 1 into tube No. 2 and from tube No. 2 into tube No. 3. This is done in order that the organisms may be well separated, so that the colonies will not be too closely packed in the "plates" which are to be made. The contents

of each tube is then poured into a Petri dish which has been previously sterilized by heat. The medium is allowed to harden in these dishes, which are then placed in the incubator at 37.5° C. for sixteen to twenty-four hours. At the end of this time we find that the single organisms have been held in position as the medium hardened and have developed into colonies. There are, of course, many such colonies on any given plate. If typhoid bacilli are present they make their presence known in the formation of peculiar thread-forming colonies of a light-green color, while other organisms grow in non-thread-forming colonies. It is not claimed that this is always the case—that is to say, that typhoid bacilli never form non-thread-forming colonies and that other micro-organisms never form thread-forming colonies. If this were always the case, no second medium would be necessary for the complete isolation and identification of the typhoid bacillus. It is claimed, however, that in any given case a sufficient number of typhoid bacilli give rise to these thread-forming colonies, so that if these organisms are at all present they will be detected. To meet the contingency mentioned the "tube medium" is brought into play. These dishes are uncovered and placed upon the stage of the microscope; by means of a sterilized platinum needle a number of these thread-forming colonies are "fished" and transplanted into this "tube medium" by means of a "stab inoculation." These tubes after having been thus inoculated are incubated for sixteen to twenty-four hours. If the micro-organism which has been thus transplanted is a typhoid bacillus there occurs a diffuse cloudiness evenly distributed throughout the medium or a greater portion of it without the production of gas either free or evolved by stirring. If the micro-organism is not a typhoid bacillus it does not cause such a diffuse cloudiness and may or may not produce gas.

It is claimed that any micro-organism which responds characteristically to both of these tests is a typhoid bacillus and will respond to any test known for that organism. If any man thinks he has obtained results other than this I would like very much to see the organism with which he is working, for I believe that if such a result has apparently been obtained it is due to the fact that the media which has been employed has not been properly made. This leads me to the next point. The chief objection which has been raised to this method is that it is a very difficult one to pursue; that, in particular, the "plating medium" is a hard one to make. The reason that it is regarded as a difficult medium to make grows out of the fundamental conditions which exist in bacteriological laboratories to-day. It is a fact that there does not exist a uniformity of methods in different laboratories with respect to the manufacture of artificial culture media. To no one point does this apply with greater force than to the method employed for regulating the degree of acidity or alkalinity of such media, and, what is more important still, to the production of the normal acid and alkaline solutions by the means of which such a degree of reaction is produced. It is no wonder, then, that men working with different methods find difficulty in producing a medium, such as this, the usefulness of which largely depends upon the fact that its degree of acidity must be regulated within narrow limits.

It is also claimed that there are a few species of typhoid bacilli which fail to react to this method. If this is the case—and it has by no means been proven—statistics show that it is so seldom the case that it in no way invalidates the method as a means of diagnosis.

Now, what can we do with this method? Dr. Hiss' statistics show that from the sixth to the thirtieth day in typhoid fever it is possible to isolate the bacillus from the feces in about eighty per cent. of cases. My own experience, which is limited to sixteen cases, is much better than this for in only one did I fail; this was unquestionably a case of typhoid, as shown by the presence of a positive Widal reaction with a 1 to 50 dilution and a characteristic leucocyte-count. I do not hold, however, that it is as infallible a method as my statistics would show, for I believe that my results have been somewhat due to good luck in that the fecal matter in these cases contained a large number of typhoid bacilli. I want to state, however, that in my cases in all but three the tests were made within three hours after the feces had been voided by the patient. This speedy examination of feces after excretion by the patient I believe to be, in our present knowledge, an essential point in the carrying out of any isolation method.

There are two other laboratory factors available for the diagnosis of typhoid infection which deserve mention. These, although perhaps not strictly bacteriological in nature, are nevertheless too valuable to miss in this connection. We have known for a long time that the leucocyte-count in pure typhoid infection presents certain differences from that which occurs in other infective conditions. Dr. Thayer of Johns Hopkins University has recently taken up this subject and made a very extensive study of it. He shows that in pure typhoid infection, in addition to a hypoleucocytosis, the percentage relationships of the different classes of leucocytes is altered from that which occurs in health or other infective conditions. The polyneutrophilic leucocytes are markedly reduced in number, often falling as low as fifty per cent. The large mononuclears are increased in number, constituting from five to fifteen per cent. The lymphocytes and eosinophiles remain about normal. No abnormal leucocytes are present. A consideration of these facts shows that in the differential leucocyte-count we have a laboratory factor of vast importance in the diagnosis of typhoid infection.

The Ehrlich, or so-called diazo-reaction, I only mention here in order to condemn it as a means in the diagnosis of typhoid infection. It

occurs in altogether too many other conditions to be of any considerable value here. It may, however, be of slight use in connection with a slightly pronounced leucycyte-count or a positive Widal with a low dilution in atypical cases where a patient search for typhoid bacilli in feces and urine has been unsuccessful.

The practical question which now confronts us is, What aid is the laboratory able to render in the diagnosis of typhoid infection? In the consideration of this question I do not propose to outline the methods of procedure most suitable for employment in large public laboratories where work is often necessarily done under great disadvantages, but to indicate the most accurate procedures when put into operation under the most advantageous circumstances and in the most competent hands.

In clinical practice patients with typhoid fever present themselves for diagnosis at various times during the course of the disease. For practical purposes they may be divided into two classes according to the time in the course of the disease that they come under the observation of the practitioner: (1) Patients in the second, third and later weeks of the disease in whom the characteristic symptoms have not developed and where oftentimes the diagnosis must forever remain in doubt unless some aid is invoked other than clinical symptoms. (2) Patients in the first week of the disease in whom characteristic symptoms have not yet developed and where we seek to make an early and sure diagnosis.

In the first class of cases, except from the beginning of the fourth week on, I give preference to the Hiss isolation method. From the fourth week on I give preference to the Widal reaction. I give preference to the Hiss isolation method for three reasons: (*a*) Scientifically it is the best proposition and clinical statistics show that it is the surest proposition. No competent bacteriologist doubts for an instant that the isolation and identification of a given micro-organism received from the body of a diseased person is by far the surest and most absolute way to prove that the person is infected with that micro-organism. Clinical statistics show that we are more apt to isolate the typhoid bacillus from the feces in this class of cases than we are to get a positive Widal reaction. Let us see. Different authors vary slightly in regard to the statistics of the Widal reaction. A fair estimation, however, is as follows: In typhoid fever in the second week we get a positive reaction in about sixty per cent. of all cases; in the third week in about eighty per cent.; in the fourth and later weeks, in about ninety per cent. As previously stated, by the Hiss method the bacillus can be isolated from the feces in about eighty per cent. of all cases. In the second week, therefore, the very time that the vast majority of these cases come up for differential diagnosis, we have a leeway of twenty per cent. in favor of the Hiss method as the surest proposition. In the third week we have an even chance in addition to the fact that scientifically it is the better proposition. In the fourth and later weeks the Widal reaction has ten per cent. advantage and I believe that at this time the Widal is the preferable method. It may, however, be claimed that these comparisons have not been fairly made; that the facts do not show that it is possible to isolate typhoid bacilli from feces in eighty per cent. of cases in the second week, but that this result can be accomplished from the sixth to the thirtieth day. If we draw a comparison on this basis we see that the Widal reaction, giving positive results in sixty per cent. in the second week, eighty per cent. in the third week and ninety per cent. in the fourth and later weeks, gives an average of seventy-six and two-thirds per cent. in practically from the sixth to the thirtieth day. Hence, on this basis we have a leeway of three and two-thirds per cent. in favor of this isolation method, in addition to the fact that scientifically it is by far the better proposition.

b. Clinically it is the easier proposition. I do not know what the experience of other men is, but mine is that it is not always the easiest and simplest thing to get blood from a person sick with typhoid. Of course we can do it and do do it, but when we consider that in order to get out of a Widal reaction what there is to be got it is fairly probable that we shall have to take several blood specimens at various times it does not become the easiest proposition for the clinician to handle. Compare this with the very simple method of obtaining feces. These may be procured when voided without in any manner disturbing the patient and without his knowing that any special research is to be made.

c. From a laboratory standpoint this isolation method is the easier proposition. It takes actually less time to conduct this isolation test than it does to do a Widal as it should be done. The elapsed time, thirty-six hours, is quick enough for all practical purposes. Of course I speak here only in regard to the man who is thoroughly drilled and competent to handle the method. A positive result with the isolation method, of course, means a positive diagnosis of typhoid. Does a negative result negative a diagnosis of typhoid? By no means. In case of a negative result it is necessary to go back and control the case by other laboratory factors, such as the Widal reaction and the leucocyte-count. In this way I believe it is possible to say with great positiveness in this class of cases that a disease is or is not typhoid.

In the second class of cases, those in the first week of the disease in which the characteristic symptoms have not yet developed and we seek to make an early and sure diagnosis, it must be confessed that laboratory aid is of limited service. Isolation tests are useless and in our present knowledge a waste of time. The most valuable methods here are the Widal and leucocyte (differential) count. If we are fortunate enough

to secure positive results we have a diagnosis. If not we must wait until a later time.

Latterly much has been said in regard to the occurrence of typhoid bacilli in the urine during and subsequent to typhoid fever. While it is true that the bacilli are present in the urine in a fair proportion of cases of this disease, observation has shown that they do not appear in this location until the defervescence of the disease has begun. Very often they are not found until the temperature has practically returned to normal. These facts render the bacteriological examination of the urine of little value from a diagnostic standpoint, except in rare cases which are not seen until convalescence is nearly established.

During the last few years numerous endeavors have been made to obtain the specific bacilli from the blood of typhoid patients. In many quarters such attempts have met with marked success, the organisms having been found in from 70 to 83 per cent. of the cases examined. While this procedure as a diagnostic measure strongly appeals to the scientific observer, it is scarcely probable that it will be adopted by the clinician for routine employment, except perhaps in hospital work. For the proper carrying out of this method at least 5 c.c. of blood are necessary. The discomfiture to the patient in obtaining such an amount is a serious obstacle to the employment of this procedure in private practice. It seems certain that its use should be restricted to those cases in which all other methods of bacteriological diagnosis have been tried without avail.

In considering the bacteriological diagnosis of typhoid fever, as applied to individual cases of this disease, one idea should always be borne in mind. There is no one method by means of which a man can sit down in the laboratory and with ease and positiveness make a diagnosis for or against typhoid in all cases. It is only by bringing into play all the factors that the laboratory can control, by taking these and very carefully working them out, and then going back to the bedside of the patient and there carefully intertwining the results with the clinical picture of the case that a man can say in very many disputed cases that a disease is or is not typhoid fever.

MEDICAL PROGRESS.

NEUROLOGY AND PSYCHIATRY.

Rate of Vibration in Ankle Clonus.—It seems possible that some aid in the diagnosis of neurosclerotic conditions may have been rendered by the observations of J. A. MACWILLIAM (Brit. Med. Jour., Nov. 30, 1901), who, by a system of delicately-arranged tambours and an improved registering apparatus, has obtained much more accurate results than previous observers. Gowers says: "The movement is uniform, from six to nine contractions per minute." Horsley and Herringham observed a frequency of from four to ten. The tracings of MacWilliam in some cases look very much like dicrotic pulse waves; those taken of the quadriceps during a knee-jerk show three or four distinct vibrations of that muscle. These more searching records confirm the observations of Herringham, who noted the tendency to fusion in some tremors. It thus seems more than probable that in ankle clonus the foot movements show only half the real number of vibrations in the muscle, but unfortunately we have, as yet, no definite knowledge as to what relation the cord bears to the rate of vibration.

Treatment of Neurasthenia.—Since this condition results from nervous exhaustion and certain changes take place in the nerve-cells due to their activity, rest is the treatment which is specially indicated. H. C. PATTERSON (The Med. Times, Nov., 1901) believes that the Weir Mitchell rest-cure modified to suit individual cases is most effectual and that the details are all important. The diet is a difficult problem, but milk modified as koumyss or matzoon, or peptonized milk can usually be taken in small quantities; during the first two weeks the patient should not be allowed to take enough to entirely satisfy his hunger. Cautiously his diet should be increased by the addition of small slices of stale bread, adding, a little later, a small chop or steak in the middle of the day and a nicely boiled egg for breakfast. His diet is gradually built up till he eats three good-sized meals during the day. Drugs are of very little use unless indicated for some special symptom. Isolation and complete freedom from care are most necessary. Massage judiciously begun and electricity should be employed in nearly every case. The faradic current is used, first to the individual muscles, then to the whole body. It will take nearly forty minutes to go over the body systematically, and then a large sponge is applied to the nape of the neck and another to the soles of the feet, allowing the current to pass for twenty minutes. The standard for the success of the treatment is whether the color of the patient is becoming better and the flesh is becoming firmer and the weight increasing. After six or eight weeks, depending upon the severity of the case, the patient should be gradually gotten up again and sent to a quiet resort for a couple of weeks at least. It is well to remember that a rest of ten or twelve weeks is less likely to be followed by a relapse than one of shorter duration.

Action of Toxic Sera upon the Peripheral Nerves.—Certain auto-intoxications are accompanied at times by peripheral neurites. Similar nervous manifestations are also frequently observed during the course or subsequent to various infectious maladies as tuberculosis and diphtheria. In all cases the microscopical lesions have been found to be identical. Wallerian degeneration is habitually present. On account of the clinical and histological similarity of the neurites observed under these conditions it has been thought that, because in those of infectious origin bacterial toxins are responsible for the changes found in the nerve fibers, in auto-intoxications a like rôle is played by poisons, accumulated in the body, due to a functional derangement of the various organs. C. DOPTER (Archiv. de Méd. Experimentale, Nov., 1901) by experimental means has conclusively proven this assumption. He finds that certain toxic sera (uremic, diabetic, cancerous, asystolitic and that of Addison's disease) when placed in contact with the peripheral nerves cause alterations in their elementary fibers. These lesions are identical with those caused by bacterial toxins, viz., peri-axilar segmentary necrosis and Wallerian degeneration. The intensity of these changes varies with the serum employed. Sera coming from various uremic, diabetic, etc., patients do not cause lesions of an equal degree of intensity. The serum from the same patient inoculated into different animals produces changes of unequal severity. In general it may be said, however, that the extent of the lesion depends upon the toxicity

of the serum employed. In analogy with these results it seems certain that the peripheral neurites observed in autotoxic conditions are due to retained toxic products in the blood which constantly impregnate the elementary fibers of the nerve trunks.

Nervous Insomnia.—In an interesting pamphlet, T. HEIM discusses the treatment of insomnia as it so commonly occurs in neurasthenia and hysteria. Like most other authors he decries the use of drugs, since they do not produce natural sleep but narcosis during which assimilation is reduced. Sometimes a glass of strong beer or porter will act well and rarely the use of bromides, bromidia, sulfonal or trional may be necessary. The latter two are, however, capable of setting up toxic symptoms, and hedonal and dormiol are preferable. The chief mainstay in the treatment will always lie in the domain of hydrotherapy and here cold packs followed in from one to two hours by friction will be most serviceable. Other measures are cold Preissnitz applications to the abdomen and cold sitz baths. Where the insomnia is accompanied by painful sensations in the back and extremities or where there is also chronic constipation or habitual congestion of the head vibration massage is often a valuable adjunct. The same may be said of general faradization, which is usually better than galvanization. Many patients will do well at the seashore, but the severer cases are more rapidly improved in woody or moderately elevated places. A proper resort must be selected for each individual case. In all, a quiet life free from all excitement must be possible. The same may be said of the various watering-places which have been recommended. There remain two further therapeutic measures—hypnotism which is an excellent remedy, though there are many in whom the hypotic trance cannot be induced, and the use of drugs other than hypnotics which must aim to remove the cause of the nervous condition.

PATHOLOGY AND BACTERIOLOGY.

Relation of Renal Disease to the Circulatory System.—The primary effect of kidney disease is obstruction of the circulation in the capillaries and arterioles. Considerable discussion has appeared on whether the cause lay in the contraction of the capillaries or arterioles. W. H. BROADBENT (Practitioner, Nov., 1901) believes that the condition of the capillary contraction controls physiologically the amount of osmosis and following the law of capillary attraction and repulsion the amount of resistance depends largely upon the character of the contained fluid. The retinal hemorrhages present in such small vessels can be due only to increased pressure within them which must be the result of obstruction beyond them, or in the capillaries. A similar conclusion is suggested by a study of cerebral hemorrhages. Given this resistance to the normal flow there must be increased power to drive the blood onward and hence the hypertrophy of the heart. Greater force from behind causes high pressure in the intervening arteries and hence the high-tension pulse. In detecting this change the point to observe is the fulness of the artery between beats, the absence of the sudden subsidence as the wave passes. Constant high pressure later leads to muscular hypertrophy and finally degeneration of the arterial walls and heart, the various symptoms which arise depending upon whether one or the other part of the system gives out first. Broadbent believes that the convulsions are due to high intercranial pressure. Convulsions may occur in association with high arterial tension when there is no renal disease. There does not seem to be any relation between the amount of urea or nitrogenous waste matters in the blood and convulsions. Free venesection is, therefore, strongly indicated in a case of uremic convulsions. Again, he believes that Cheyne-Stokes breathing results from high arterial pressure as it has been an invariable antecedent of this phenomenon, in his experience, whether or not there has been albuminuria. Mercurial aperients, he finds, act best in relieving high arterial pressure. Five grains of calomel or pil. hydrargyri with colocynth and hyoscyamus, given three times a week, act very favorably.

Action of Ferments and Diastases on Tuberculous Poisons.—The action of the various body ferments and diastases upon tuberculous poisons and the bacillus tuberculosis is of interest as a further step in the solution of the tuberculosis question. G. CARRIERE (Archiv. de Méd. Experimentale, Nov., 1901) has taken up this subject experimentally. He finds that ptyalin, pepsin, trypsin and bile act upon cultures of the bacillus tuberculosis by extracting a poisonous substance from the body of this organism. Cultures submitted to the action of these substances possess a greater toxicity than those not so treated. When such cultures are inoculated into tuberculous guinea-pigs they do not prevent the evolution of the disease. They possess no immunizing properties. So far as the bodies of the organisms which are thus acted upon are concerned, he finds that the tulu oil extract of such is very toxic, but less so than that obtained from the bodies of these bacilli which have not been submitted to the action of these substances. Thus these ferments take away a certain portion of the toxins present in the bodies of these organisms. This tulu extract upon animal inoculation possesses neither curative nor immunizing properties.

Tuberculin Reaction as a Method for Ascertaining the Infectiousness of Cow's Milk.—Of late much doubt has been expressed with respect to the value of the tuberculin reaction as an exclusive method for determining the infectious properties, so far as tuberculosis is concerned, of cow's milk. Considerable experimental work has been done upon this subject by Rabinowitsch and Kempner. The most recent work, however, comes from OSTERTAG (Z'tschrift. f. Hygiene und Inf., Nov. 22, 1901). His observations were confined to sixteen cows. These were examined for the presence of the tuberculin reaction and clinical evidences of tuberculosis. The milk was examined microscopically for tubercle bacilli. In every case where the organisms were not thus found the milk was inoculated subcutaneously into guinea-pigs. In this manner it was possible to ascertain absolutely whether or not tubercle bacilli were present. The results show that the milk of cows which distinctly react to tuberculin, but exhibit no clinical evidences of tuberculosis never contains tubercle bacilli and hence cannot be a source of tuberculous infection. Calves and swine may be fed for weeks and months on such milk without developing any signs of tuberculosis. The presence of suppurative udder tuberculosis is the surest guide to the infectiousness of the milk. In all cases where such was present tubercle bacilli were found in the milk.

Contribution to the Biology of the Gonococcus.—It is a well-known fact that the gonococcus ceases to grow well on artificial media if the temperature is only several degrees higher than that of the human body. To ascertain if an increased body temperature will in a like way act detrimentally to the germ, G. NOBL (Wiener klin. Rundsch., Nov. 17 and 24, 1901) examined a number of cases in which gonorrhea complicated other febrile conditions. These were in three cases typhoid, in one pneumonia and in one pulmonary tuberculosis, and the author found that even with 41°

C. numerous gonococci were found in the urethral secretion which were capable of active division on proper culture media. The reason probably is that the latter can never replace the favorable conditions for microorganismal growth which exist in the urethra, despite the increased temperature.

Nature of Amyloid Degeneration.—The various theories concerning the origin of amyloid tissue are given in full by F. BROWICS (Klin-therap. Woch., Nov. 17 and 24, 1901). He himself believes that amyloidosis is due to an infiltration of the tissues with chemically altered erythrocytes or to a heaping up of these owing to slowing of the blood-stream in the capillaries and altered physical properties of the cells that result therefrom. Hyaline degeneration is explained on a similar basis and not regarded as an early stage of amyloid change.

Tumors of the Kidney.—Of the various tumors which occur in the kidney two important classes may be distinguished, according to D. VON HAUSEMANN (Zeitschrift f. klin. Med., Vol. 44, Nos. 1 and 2), namely, those directly renal in origin and those which take their start from displaced suprarenal tissue. Of the first class lipomata deserve only a passing notice since they are small cortical growths of no clinical importance. Papillomata are much more common and are as a rule also unimportant, though they have been known to assume large dimensions and even to invade the vena cava and cause malignant metastases. According to whether the papillæ are poorly or strongly developed, two classes may be distinguished. In the malignant varieties the papillæ are generally long and slender. Adenomatous tumors are very rarely met with in the kidney and many described are in reality hypernephromata, *i. e.*, suprarenal in character. The true adenomata are generally tubular in structure and do not attain a large size, while the hypernephromata are situated near the surface of the cortex, manifest their malignancy by rapidly encroaching upon the surrounding tissue and undergoing fatty degeneration, so that eventually large tumors with soft, yellowish interior and cysts filled with turbid fluid are formed. They may, however, run an extremely chronic course. Though generally sharply circumscribed, they may well destroy the remaining renal tissue by compression. Often a very careful histological examination will be necessary to reveal suprarenal structure. They share the property of other malignant renal growths in that they show a tendency to perforate into the renal vessels and inferior vena cava. The following eight points have been given as characteristic for them and distinguishing them from other renal tumors: (1) Their cortical position and macroscopic appearance; (2) their sharp encapsulation; (3) the property of the nucleoli to stain differently from the nuclei; (4) the structure of the cell-protoplasm, dependent chiefly upon fatty inclusions; (5) their similarity to malignant tissues starting from the suprarenals directly; (6) the presence of giant-cells; (7) their tendency to perforate the veins early, and (8) their property to produce glycogen. Endotheliomata also occur in the kidneys; they were formerly classed as hemangiomata and lymphangiomata. True carcinomata may be medullary, more rarely scirrhus or colloid in character, and may remain circumscribed or grow more diffusely when the kidney retains its normal shape, but enlarge considerably. Both forms may penetrate into the renal pelvis, when villous excrescences form which fill this and the ureter and metastases not infrequently form in the opposite organ. Sarcomata are more rare and generally of the spindle-cell type; they tend to infiltrate and the uninvaded renal tissue will often be found to functionate perfectly. Barring only the unimportant fibroid growths, they are the only tumors developing from the stroma. Lastly, mention must be made of teratoid growths which also may take on malignant characters and form metastases.

A New Hemoglobinometer.—The chief disadvantage which is common to all hemaglobinometers in general use is that the colors compared are never exactly of the same tint and hence the reading of the percentage is more or less a matter of guesswork. G. GAERTNER (Münch. med. Woch., Dec. 10, 1901) has constructed a new instrument which he calls hemophotograph which depends upon the principle that the greater the concentration of a solution of blood the more will the actinic rays of the spectrum be absorbed by it and hence the less intense will be the darkening of photographic paper placed underneath the solution and exposed to light. The advantages claimed are (1) comparison of identical tints; (2) great sensitiveness; (3) simplicity of the instrument; (4) permanency of the estimation, since the photographic paper can be added to the patient's history and referred to at a later date; (5) cheapness of the apparatus.

Predisposition of the Apex for Tuberculosis.—Faulty development of the first rib, which, when marked, goes hand in hand with a flattening of the upper half of the thorax and leads to the formation of a furrow near the apex, is considered by L. SCHMORL (Münch. med. Woch., Dec. 10, 1901) as the chief predisposing cause for this portion of the lung to become tuberculous. Owing to the constant pressure there will be disturbances in the circulation of the blood and lymph and poor development, or misplacement of the posterior branch of the apical bronchus will lead to improper ventilation of this part of the lung and hence retention of secretion.

Antiseptic Properties of Uric Acid.—As a result of his experiments, E. BENDIX (Zeitschrift f. klin. Med., Vol. 44, Nos. 1 and 2) comes to the conclusion that the supposed antiseptic properties of uric acid, which are considered to render impossible suppuration and tuberculosis in those afflicted with gout, do not exist, for, on adding either uric acid or the more soluble urate of sodium to cultures of various bacteria, their growth was in no way inhibited. The rarity of tuberculosis in the gouty may be due to the fact that the latter are, owing to their constitution, not liable to become consumptives, and the difficulty with which gouty joints become septic may be explained by the inability of the bacteria and their toxin to penetrate the hardened tissues.

Experimental Hemoglobinuria Caused by a Bacterial Toxin.—The injection into the blood stream of substances which have a solvent effect on the red blood-corpuscles gives rise to hemoglobinuria. A series of hemolysins have been previously described as produced by various organisms, *e. g.*, bacillus pyocyaneus, staphylococcus aureus and albus, bacillus diphtheriæ, streptococcus pyogenes, bacillus typhosus, etc. But the feeble hemolytic action of these pathogenic organisms is masked by more obvious symptoms. A more suitable organism for the study of experimental hemoglobinuria is the bacillus megatherium, which produces substances which are powerfully hemolytic without causing death or serious illness. The hemolytic action of this bacillus was first observed by C. TODD (The Lancet, Dec. 14, 1901), who obtained a culture of the bacillus from hay infusion, another from a sample of papain powder, and a third from Gral of Prague. The three races were grown in Erlenmeyer flasks at 37° C.

and the hemolytic power of the cultures tested daily on a 5-per-cent. suspension of guinea-pigs' washed corpuscles in 0.75-per-cent. saline. The formation of the hemolysin is in the main extra-bacillary; it begins between the second and third days, reaching the maximum on the sixth or seventh day. Oxygen is essential to the formation of the hemolysin, though some growth takes place anaerobically. A high degree of alkalinity favors the production of the lysin. The corpuscles of the guinea-pig and of man are highly sensitive to the lysin; those of the donkey and horse are practically unaffected. In the case of megatheriolysin various normal sera exercise a considerable anti-hemolytic action. The fact that a widely-distributed organism, which has hitherto been regarded as non-pathogenic, is capable of forming products bringing about in susceptible animals such profound blood-changes is of great interest. The results of Todd's experiments are suggestive in connection with the pathology of such diseases as blackwater fever, paroxysmal hemoglobinuria and pernicious anemia.

The Bacillus of Dysentery.—In the summer of 1899 Roger isolated a bacillus from dysenteric stools during an epidemic of that disease at Finisterre. MORZUL and RIEUX (Comptes Soc. Biol., Dec. 6, 1901) during the recent epidemic in Algiers isolated an organism in all cases examined, which they consider identical with that discovered by Roger. They also found it in the stools of several endemic cases examined. The bacillus is often associated with other organisms present in such stools. The rule is, however, that the more severe the case the greater is the number of these bacilli and the less the number of other organisms present. In several very severe cases pure cultures of this bacillus were obtained from the stools. They describe it as very similar in morphology to the bacillus coli communis. It stains easily with all the aniline dyes. It retains Gram's stain. The optimum temperature for its growth is 38° to 40° C., but it can be cultivated at 44° to 45° C. It is extremely motile, often nearly as much so as the typhoid bacillus. It grows well in bouillon, does not liquefy gelatin, forms a thin brown layer on potato, ferments sugars and does not produce indol. It is pathogenic for guinea-pigs and rabbits. It is agglutinated by the blood of animals immunized against it and occasionally by experimental typhoid serum, but only in a low dilution and the reaction is not typical.

Identification of the Colon Bacillus by Means of the Neutral Red Reaction.—It has been stated by several authorities that neutral red agar is a good medium for differentiating the bacillus coli communis from the typhoid bacillus in that the former changes the color to a canary yellow, while the latter produces no such effect. It has been claimed that the presence of colon bacilli in water may be easily demonstrated by merely inoculating such agar with a portion of the water and obtaining the reaction. R. C. ROSENBERGER (Pro. Phila. Path. Soc., Nov., 1901) has recently reviewed this subject experimentally. His work shows that neutral red agar while not affording a specific reaction in the case of the bacillus coli communis should be classified as a valuable differentiating medium. The typhoid bacillus while it does cause a fading of this medium never gives rise to the fluorescence noticed in some cultures of the colon bacillus. This test should not be depended upon as the only differentiating one in the examination of water as several very common bacteria found in such give rise to the same reaction.

Intracellular Constituents of the Typhoid Bacillus.—The essential functions of life are based upon intracellular phenomena and the great aim of biological inquiry at the present time is to obtain a more intimate knowledge of the vital processes of the cell. ALLAN MACFADYEN and SYDNEY ROWLAND (C'tlblt. f. Bäk., Dec. 5, 1901) have taken up this line of research from a fresh standpoint, viz., the study of the intracellular factors in health and disease by obtaining directly the cell substance from the living cell and eliminating so far as possible excreted substances and those formed by the cell in a given environment. For the extraction of the cellular substance of the typhoid bacillus they employed a technic which involved the trituration of the organisms in the presence of cold. In this manner the injurious effects of heat upon the substances present in the cell protoplasm are avoided. The cellular substance thus obtained was submitted to animal experimentation. The inoculation of such into guinea-pigs, rabbits and monkeys is regularly followed by the appearance of agglutinins in their blood. All the animals, but especially the guinea-pigs, showed a marked tolerance for this typhoid cell juice. In all cases the inoculations were followed by marked immunization and the animals were thus easily protected against lethal doses. The same result was obtained when the juice had been preserved for months by the use of thymol. It has also been ascertained that the typhoid bacillus produces hemolysin in various culture media. Thus, the bacilli grown in spleen juice to which serum has been added produce hemolysin in eight days. The endeavors to demonstrate the production of a soluble toxin by the typhoid bacillus have not been successful. If the symptoms of typhoid fever are due to an intoxication as well as to infection the detection of the toxin would mark a great advance in the treatment of the disease by inoculation. All that can be said at present is that if the bacillus produces a soluble toxin ordinary laboratory culture media are not suitable vehicles for its origin. Even when cultivated in fresh juices from various organs of the body, the production of a soluble toxin cannot be demonstrated.

An Electro-Thermal Paraffin Bath.—Since the very broad introduction of electricity into laboratories and establishments in general where scientific work is being done, to the greater or less exclusion of gas, it has become imperatively necessary that some form of electrical regulator be devised. One for which much accuracy is claimed is technically described by its inventor, R. H. STERN (Brit. Med. Jour., Dec. 14, 1901). The heat is furnished by a pair of ordinary incandescent lamps in which the current is closed and broken by the movement of a cleverly-devised armature which, in its turn, is governed by the expansion and contraction of a column of mercury. This thermostat is very delicate; it holds a temperature so even that no variation is indicated by an ordinary thermometer. This regulator will be welcomed by not a few who have been told that an electrical apparatus which should be reliable was an impossibility.

Biologic Test for Semen.—A test of practical value for the detection of the nature of suspected seminal spots has been proposed by C. G. FARNUM (Jour. Amer. Med. Assoc., Dec. 28, 1901). The test is based on the fact that if bacterial filtrates, peptone, milk, egg-albumin, albuminous urine, blood-serum, etc., are injected at intervals for a period of time, they produce substances in the blood of the animal which form specific precipitates with the substances injected. After experiments made with animal semen, it was also found that the blood serum of rabbits treated with human semen gives a distinct reaction (precipitate) with both recent and old emulsions of human semen in salt

solution, also with human semen which had been dried and preserved thirty-four days on filter-paper and on cloth. But with emulsions of bull, of dog, and of goat testicles no reaction took place. With human blood serum, human semen gives no precipitates. At present it is probably safe to conclude that blood sera treated with different semens and testicular emulsions contain specific precipitins. That the substance which gives rise to the precipitin is contained in the semen itself seems probable from the absence of precipitate in human serum to which is added the serum of rabbit treated with human semen.

GENITO-URINARY AND SKIN.

Skin Eruptions in Renal Disease.—The correlation between skin and kidney lesions has been considered one of undoubted fact for hundreds of years and yet later authorities, according to J. J. PRINGLE (Practitioner, Nov., 1901), have found that it is the exception rather than the rule that the various skin eruptions have any relation to renal disease. The skin eruptions which are connected with nephritic conditions may be classified as those of the early stage, such as pruritus, urticaria and eczema; those in the final stage, such as the universal erythematous bullous or disquamative eruptions, and the purpuric and other hemorrhagic eruptions. Dieulafoy in 1882 made the important observation that pruritus is often an early, or, indeed, the first, symptom of Bright's. It may present all degrees of severity, from a mere localized itching, often about the legs, to an intense and unceasing torture. Urticaria as a symptom of Bright's is very rare, and even eczema is not thought to be more common in patients suffering from albuminuria than in others. Thursfield and Pye-Smith express similar views. Erythema papulatum uræmicum is the most characteristic skin affection the relation of which to renal disease is established, but it is rare. It consists of numerous large papules or nodules with a red areola arising upon an erythematous base, subsequently becoming deeper in color. It begins on the extensor surface of the arms and may spread over the entire body. General bullous eruptions are very rare. Hemorrhages into the skin as well as other tissues of the body are, of course, very common. Boils, carbuncles and ecthymatous lesions are also common, as in diabetes. The cause of these eruptions is unknown, but it is thought that they are similar to those caused in septicemia or ptomain-poisoning, toxins acting through the vasomotor and trophic nerve systems. It is certain that uric acid and urea are not the toxic agents, and it is thought that substances of the aromatic group which reduce Fehling's solution are the offending agents.

Cold in the Treatment of Skin Affections.—In a series of cases comprising lichen planus, eczema lichenoides and herpes tonsurans, E. SAALFELD (Therap. Monatshefte, 1901, S. 356) successfully utilized liquid air to freeze the diseased areas as a means of cure. The spot to which the extreme cold is applied promptly swells; then a white wheal with erythematous border is formed, and after a few hours an acantholytic bleb develops. Within three weeks normal white skin covers the treated area. After early trials with liquid air, Saalfeld adopted as a freezing agent a mixture of chlorethyl with chlormethyl, a much less expensive remedy than liquid air. With this mixture the parts are sprayed for a period varying from thirty to ninety seconds after the appearance of the icy incrustation.

Early Diagnosis of Tuberculosis of the Bladder.—Even the most skilful microscopist may be unable to find tubercle bacilli in the urine in the early stages of tuberculosis of the bladder. In this event the clinician may turn to animal inoculation as an aid to diagnosis, but, as this method can yield no results for several weeks, P. ASCH (Berl. klin. Woch., Nov. 18, 1901) recommends early cystoscopy. It is true that the influence of cystoscopy on the tuberculous process in advanced cases is detrimental to the patient; this, however, is not true, according to Asch, in the early stage of a tuberculous cystitis, when diagnosis without this aid may be impossible. The principal facts in a typical case described by its author are as follows: Frequent urination, often painful; urine constantly clear, free from albumin and sugar; microscopically, the centrifuged urine showed red blood-cells; cystoscopic examination revealed a long ulcer with swollen borders and white central deposit situated about the mouth of the left ureter.

Pleuritic Urticaria.—This phenomenon has been observed occasionally in pleurisy with effusion, and most frequently appears after thoracentesis, according to G. MINCIOTTI (Gazz. degli Osped., No. 135, Nov. 10, 1901). Its appearance at this time is explained by the fact that the upper strata of the exudate is withdrawn, while the deeper portion, containing micro-organisms and their products, remains. This latter, in course of absorption, is taken up by the lymphatics, producing an intoxication of the system, with a consequent toxic urticaria. The eruption seems to bear a certain relation to the rapidity with which the exudate is absorbed. Observers of the phenomenon believe that the earlier the appearance of the eruption and the greater its intensity, the more promptly does absorption take place. Treatment of the dermatosis is considered unnecessary.

Dermatitis Gangrenosa.—A case of this rather rare disease, beginning as a pustular rash, impetigo, is described by J. M. FINNEY (Dublin Jour. of the Med. Sciences, Dec., 1901). In three weeks the pustules had become deep and wide ulcers, and a destructive panophthalmitis had set in. There was a deep contrast between the raw-meat color of the floor of the ulcers, the purplish red shade of their edges, and the fair skin of the body. There was no evidence to associate the disease with vaccination or varicella. Tubercles were found in the thymus gland and lungs. The disease is most common in females, does not seem to be contagious, but is often fatal.

OBSTETRICS AND GYNECOLOGY.

Proper Method of Protecting the Perineum.—It is well known that when Nature is left to herself during the expulsion of a child the percentage of ruptured perinei is very large. The method of supporting the perineum which has been in vogue at the Sloane Hospital for many years is given by L. E. NORFLEET (Med. Rec., Dec. 21, 1901). The aim throughout is to allow the head to advance very slowly and gradually, permitting the perineum time to become relaxed and stretched. The patient's bowels should always be emptied. When the head comes down on the perineum the right hand should be placed flat against the perineum, the fingers on one side, the thumb on the other side of the vulva. The left hand holding the occiput from above, with the right hand from below, is entirely sufficient to control the advance of the head. As soon as the forehead can be felt behind the anus and held from slipping back into the vagina between pains, chloroform should be given until the advance of the child can be entirely governed by the accoucheur. Chloroform may be given earlier in the second stage if the pains are very severe. When the patient is under the influence of the chloroform, by pushing the forehead upward toward the pubes and if

necessary stimulating contractions of the uterus slightly with the left elbow, the head may be slowly "shelled" over the perineum and a tear very seldom results.

An Extraordinary Case of Artificial Respiration.—A well-developed male child was delivered with forceps under chloroform at full term by J. J. REDFERN and G. NEWBY (Brit. Med. Jour., Dec. 14, 1901). The case was not one which presented any unusual difficulty. The cord was twice around the neck and respiration after delivery was entirely absent. All the more usual methods of excitation were used without avail. Intubation failing in the absence of a sufficiently small tube, tracheotomy was performed and a catheter introduced into the trachea. After an hour's work a bicycle pump was connected with the tube; later a pair of small hand bellows was found to work better. At the end of two hours and a half the first inspiratory act was noted. During all this time the heart's action had been entirely under the control of the bellows operator and averaged from 50 to 100 beats. After six hours respiration gradually failed and at the thirteenth hour the child died. The points of unusual interest are (1) the fact that the heart continued to beat for two hours and a half without any voluntary respiratory effort; (2) increased use of the bellows produced marked quickening of the pulse-rate; (3) the child never gave any other sign of life than action of the heart and lungs and clonic spasms of the right hand. The cause of respiratory failure involves the following possibilities: (1) Possible pressure on the vagus or phrenic nerves by the double cast of the cord around the neck; (2) chloroform poisoning by absorption from the mother; (3) injury to the respiratory center through pressure by the forceps on the child's head.

Fetal Placental Circulation.—The relation between the circulation of the maternal and fetal blood within the placenta has long been an interesting subject and has lately been settled beyond reasonable doubt on the point that the blood of the mother does not enter the vessels of the child. B. S. SCHULTZ (Centralbl. f. Gynäk., Dec. 7, 1901) presents an interesting and simple method of proving this fact. A fresh placenta is taken and floated upon a dish full of warm water with the maternal surface uppermost. The umbilical vein is dissected out of the cord and provided with a cannula. Through this warm milk is run until a high degree of pressure is obtained. It will then be found that the exposed surface of the placenta is entirely free of milk although the head of that fluid has been sufficient to squeeze out blood from the vessels of the maternal surface. It will be found that the placenta will erect itself, so to speak, take on the full form which it had in the uterus, even to becoming concave toward its fetal aspect. While making these changes in position and form blood will continue to flow from the vessels of the maternal surface, but milk does not escape. Furthermore, the separate cotyledons of the organ begin to appear discrete from each other and still the injecting fluid remains entirely within the fetal circulation. If at this point one of the cotyledons is cut with a knife an active stream of milk with oozing will appear. It is best to select the vein for this injection because of its comparatively wider distribution in the organ than the arteries themselves, and also because its lumen remains comparatively larger than the lumen of the arteries and therefore permits the milk to flow more freely. This is a simple and effective means of demonstrating that mother blood and child blood are separate throughout intra-uterine life. It therefore follows that when the child perishes through early separation of the placenta from the uterine wall, death does not occur through lack of blood, as has ordinarily and for many years been held. When such separation occurs, the child does not lose a single drop of blood. Similarly, when a child is born apparently dead from the same cause, it is not from hemorrhage, but rather from deficient aeration of the blood that its condition is at all serious.

Dysmenorrhea.—Any new method of treating this troublesome and common condition is usually tried with enthusiasm. A. THEILHABER (Centralbl. f. Gynäk., Dec. 7, 1901) brings out the following facts regarding the etiology and antomical foundation of the trouble. A submucous myoma is a common cause and always produces exceedingly painful contractions of the uterus between and during menstruation. It is especially during menstruation that the womb is excited and that this foreign body provokes greatest trouble. Perimetritis is also a very usual factor in exciting dysmenorrhea. In perhaps more than three-quarters of the cases either one or the other of these two elements is present. The other patients suffer more or less from purely functional derangements. Under this heading must be numbered the various kinds and degrees of displacements of the uterus. The precise seat of the pain is probably in the cervix at the circular muscle bands about the internal os. A condition of tetanic contraction of these bands must be exceedingly painful as is shown also by similar conditions in spasm of the pylorus, and of the cardiac end of the stomach, of the intestines, and of the anus. The exciting factors of such spasms in the womb are nervous conditions like hysteria, neurasthenia, mental disturbances, various forms of sexual abuse and others. In the treatment of this condition, the aim should be to overcome the cause, when one can be definitely assigned. The new method which he proposes to follow out is a step in addition to that which he enunciated not long ago, which consisted in dilating and dividing these muscle bands with the hope that their reunion would be imperfect enough to stop the trouble. He now aims not only to dilate and divide, but also to remove this circular layer *in toto*. In order to avoid cutting away too much tissue, he has devised an ingenious knife which is not unlike a potato-parer. The blade is 1 dec., 5 cm. long, with a little slot in its center, one edge of which is lower than the other and sharpened. The blade is concave away from the edge of the knife. After the canal has been dilated or cut enough to permit the introduction of this blade, it is carried around, pressing the knife firmly against the mucous membrane. The cutting edge projects 6 mm. below the surface of the instrument, so that it is impossible to cut away more than this amount. The author states that the instrument works quickly, directly, thoroughly, safely and gives results that are very promising.

Pessaries in Prolapse.—Artificial means of holding up the uterus in prolapse of the uterus and of the vagina are valuable only when the patient cannot be, for any systemic reason, operated on. A large number of pessaries have been devised for all purpose, and this is one of the most fertile fields both for their invention and for their use. W. ROSENFELD (Centralbl. f. Gynäk., Dec. 7, 1901) presents one for which he claims great advantages. It consists in, first, a funnel-shaped cup, aimed in its size and form to fit over the cervix and be retained there by suction. Drainage is secured by five or six rather large holes. From the center of this cup passes a stem, in length varying according to the size of the vagina and other conditions. This is the second part of the instrument and is provided with a generous drainage hole. Its diameter is, relative to that of the cup, rather small. After the uterus has

been replaced manually the pessary is introduced in such a manner that the walls of the vagina fall about it and the cup is held against the cervix by the fornices. The stem is now left free to move about more or less in the vagina according to the bladder and rectum being full or empty and according to the position of the patient. Like all pessaries the instrument needs watching. The author claims that, in point of efficacy and convenience, when properly applied and thereafter cared for, it is superior to all others that he has used.

Pregnancy and Albuminuria.—Recently the belief that lesions of the kidney are entirely responsible for the presence of albuminuria during pregnancy, and especially the eclamptic seizures, has been much modified by valuable investigations. D. BERRY-HART (Practitioner, Dec., 1901) briefly reviews Schmorl's work to show that eclampsia is due to a strong irritant developed in connection with the placenta, causing degenerative changes in the liver, lungs, and heart, as well as the kidneys, and hence albuminuria is only one symptom of a systemic toxemia. This irritant he believes to be a fibrin ferment derived from placental giant cells. This advance in pathology has led to a modification of the treatment of eclampsia and an avoidance of violent and depressing remedies is particularly urged. We must remember that various organs are undergoing changes, that the nature of the irritant is still hypothetical, and that we still do not know by what organ it is eliminated, if eliminated at all. When albumin is found, a milk diet, rest in bed, attention to the bowels and an occasional hot bath are all that is usually necessary. If headache and eye-symptoms supervene induction of labor is indicated. If eclampsia has occurred, powerful purgatives, pilocarpine and venesection should be abandoned as being too depressant. Chloroform is very valuable and should be given at once to control the seizures. Begin with hypodermic injections of morphine, gr. ⅓ to ½ and gr. ¼, repeated in two or three hours if necessary. The morphine treatment was first started in Germany, but is now fairly well accepted in England. The effect of morphine is more lasting than that of chloroform and constant attention is not so essential. A large saline by bowel should next be given or an intravenous injection in very severe cases. Hot packs are beneficial, but oxygen inhalations seem to do little good. A minimum of judicious treatment seems most successful. Labor should be accelerated, but the rapid methods of Dührssen and Cæsarian section are seldom necessary.

EYE, EAR, NOSE, AND THROAT.

Ocular Symptoms in Bright's Disease.—These symptoms are divided by W. H. H. JESSOP (Practitioner, Dec., 1901) into three groups: (1) Those to be seen externally; (2) those seen by the ophthalmoscope, and (3) uremic amaurosis. The naked eye appearances are those of edema of the lids, especially the lower, which is usually temporary. The conjunctiva may show a bright, shining, watery appearance and subconjunctival hemorrhages are rather frequent. The retinitis of Bright's is usually bilateral. Its severity is no clue to the intensity of the kidney trouble nor the amount of albumin in the urine. Vision, as a rule, is not much affected, except when optic neuritis, extensive hemorrhages or changes around the yellow spot are present. In chronic nephritis, especially in granular kidney, the vision tends gradually and steadily to deteriorate, but total blindness seldom occurs. The appearances of the background vary considerably and no picture may be said to be pathognomonic. The picture may vary according as the white spots and plaques, retinal effusion, hemorrhages, vascular changes, and optic disc changes predominate. Diabetic retinitis is perhaps the lesion the most likely to be taken for Bright's. From statistics it would appear that very few cases live beyond two years after the retinitis has been diagnosed, and most cases with granular kidney die within a year. Uremic amaurosis is characterized by great loss of vision, sometimes amounting to complete blindness. As a rule, it comes on suddenly, clears up in one or two days and may or may not be accompanied by ophthalmoscopic changes.

Treatment of Empyema of the Antrum.—Excellent results in diagnosis and treatment of purulent conditions of the antrum of Highmore through the ostium or accessory openings are reported by N. H. PIERCE (Phil. Med. Jour., Dec. 21, 1901). These accessory openings are probably pathological, but still are quite constant and found in the middle meatus of the nose near the hiatus semilunaris. For washing out the sinus, a Schmidt's cannula is used, connected by a tube with a bulb syringe to a gallon percolator jar. The parts are anesthetized with cocaine or suprarenal extract, the point of the cannula introduced under illumination into the middle meatus, and the ostium or accessory openings felt for and entered. The irrigating fluids must be sterile and bland, such as Thiersch's solution, solutions of sodium bicarbonate, carbolic acid (2½ per cent.), boracic acid, or acetotartrate of aluminum. It is well to use this method before resorting to surgical puncture for diagnosis or treatment.

Mycosis of Pharynx and Base of the Tongue.—On account of the characteristic appearance of this condition, small pointed masses of milk-white color, projecting from the mucous membrane to the extent of an eighth of an inch, there ought not to be any serious difficulty in diagnosis and yet it is often treated for follicular tonsillitis or diphtheria. E. H. GRIFFIN (N. Y. Med. Jour., Dec. 14, 1901) shows how difficult the treatment of these cases sometimes becomes. The patient's throat was treated in succession by the application of chronic, carbolic, nitric and sulphuric acids, but these seemed to irritate the growth and produce an extension. Smoking seemed to retard the growth. Out of fifty cases treated the author has never seen it occur in a man and ascribes this to the prevalence of the smoking habit among men. By picking out each root with forceps and cauterizing with a bent probe with chromic acid a marked effect resulted, but not entirely satisfactory. The following prescription, at first used on account of anemia, really gave the best results:

℞ Tinct. chlor. ferri.....3 iij
Glycerini .....3 ij
Aquæ q.s. ad.....3 iij

Sig. One teaspoonful every three hours as a gargle, without water, and then swallow. The combination of this last method following the evulsion of the membrane and cauterization with chromic acid seemed very satisfactory.

MEDICINE.

Causes and Symptoms of Uremia.—Numerous theories have been advanced in regard to the cause of uremia, but none of them are entirely satisfactory. J. R. BRADFORD (Practitioner, Nov., 1901) reviews the experimental work that has been done and shows that the mere retention of normal constituents of the blood, even when both kidneys are removed, will not produce uremia. On the contrary, the animal or person dies in a condition of profound asthenia after several days of progressive weakness and diminution of temperature. The injection of urine into the blood causes

symptoms resembling uremia and, hence, the retention of toxic substances normally excreted in the urine has been given as a cause, but acute uremia frequently supervenes with little or no suppression and complete calculus suppression causes the symptoms of latent rather than acute uremia. We know that there is frequently an abnormally rapid wasting of the body in cases of nephritis, and it is suggested that owing to the renal disease the tissues undergo an anomalous metabolism with the formation of more or less toxic substances which are liberated in the blood-stream, and, owing to the impaired activity of the kidney, these substances may accumulate and give rise to uremia. Dyspnea is the most constant and one of the most important symptoms. In the acute uremia it may be of the hissing character described by Addison or of the Cheyne-Stokes variety. Convulsions may so closely resemble epileptiform seizures that the diagnosis is difficult, and no other symptoms of renal disease be present. The temperature in acute uremia is usually subnormal, but pyrexia and even hyperpyrexia may result from several seizures. In uremia the gums are usually spongy and bleed easily and the patient complains of an extremely offensive taste and smell in the mouth. Examination of the fundus oculi will almost always reveal papillitis or albuminuric retinitis, and acute uremia occurring during a chronic renal trouble will always show retinal changes. Acute uremia is more especially associated with chronic Bright's due to the form described as the contracted white kidney which often has an insidious onset with no dropsy and an abundance of urine containing considerable albumin.

Sepsis Due to the Colon Bacillus.—Two cases of sepsis in very young infants are reported by O. V. KOVALEVSKY and E. MORO (Klin-therap. Woch., Dec. 15, 1901) in which the colon bacillus was found as the cause. Both infants were brought to the clinic when only a few days old, suffering apparently from marasmus; in the first case the sepsis took its start from a severe cystitis with fibrinuria, followed by pyelonephritis and general invasion of the system, while in the second the primary focus could not be detected and jaundice with hemorrhages was a prominent sign. In both the colon bacillus was isolated from the blood after death and its identity established by serum reaction.

Roentgen Rays in Internal Medicine.—The value of the Roentgen rays as an aid in the diagnosis of affections other than surgical is ably discussed by H. HILDESRAND (Münch. med. Woch., Dec. 3, 1901). In apical tuberculosis this method gives no better results than auscultation and percussion, since the proximity of the apex of the lungs to the clavicle and first rib gives but poor pictures and since the focus must be of considerable size to throw a perceptible shadow. The results are much more gratifying in gangrene of the lungs, since the exact locality can be determined and since, when multiple lesions are found, useless operation may be avoided. The same applies to echinococcus, tumors and foreign bodies in the lung, while the method offers no advantage in pneumonia or pleurisy, though in the latter a horizontal upper level would speak for hydro- or pyopneumothorax. In simple pneumothorax the differential diagnosis between this and bronchial stenosis and emphysema may be difficult; an X-ray picture will rapidly clear the diagnosis by showing the sharp border between the lung and the empty pleural sac. For diseases of the heart the Roentgen rays can be dispensed with. They are of considerable more value in the diagnosis of aneurism of the aorta, though an abnormal course of the aorta and mediastinal tumors in immediate proximity to the aorta may give similar pictures. It has been recommended to transilluminate the body in an oblique direction from below and to the left anteriorly to the right. By this method the esophagus gives no shadow, but stenoses and dilatations can be diagnosed by the introduction of sounds which throw shadows. Foreign bodies in the gullet are readily determined by the oblique method. Concerning the condition of the abdominal organs, the Roentgen rays have in the main been disappointing. Though the size of the stomach can be determined by filling this with bismuth or shot, the method is far too troublesome and disagreeable to be practical. The course and condition of the large intestines may be demonstrated by giving the patients bismuth for several days, but this, too, has little value. A fertile field for diagnosis, however, lies in the detection of calculi, especially the renal calculi, not uratic in composition. In the majority of instances a shadow will form, though a negative result does not speak conclusively for the absence of stones. Vesical and prostatic stones also readily show, but in the majority of cases the presence of gall-stones cannot be proven unless they contain a high percentage of carbonate of lime. Little value is to be expected from the Roentgen rays in diseases of the central nervous system, and their only slight value in such disorders as Pott's disease, chronic arthritis and osteomalacia must be mentioned for completeness. It is thus clear that while a great aid in diagnosis, too much has been expected of this method, in internal medicine at least.

Early Diagnosis of Tuberculosis.—It is of the greatest importance to detect tuberculosis in its incipiency and the various methods are reviewed by A. MOELLER (Münch. med. Woch., Dec. 10, 1901). The one most frequently practised is the examination of the sputum. If a wet pack be applied to the chest over night and the patient be rubbed thoroughly in the morning the findings will more often be positive. Another modification is to allow the sputum to stand for forty-eight hours at 37° C., when multiplication of the few bacilli present takes place and their detection is facilitated. If results are all negative there still remain the animal experiment and the tuberculous injection as diagnostic aids. The latter is free from danger if the old tuberculin is used and asepsis is practised. The proper dose to begin with is $^1/_{10}$ milligram and a rise of 0.5° C. is considered a reaction. If this does not take place, the dose must be gradually increased. The gastric irritation which may set in is readily controlled by diet and carminatives. The recently-advocated agglutination method has not stood the test of experience.

Diagnosis and Prognosis of Mixed Infections in Pulmonary Tuberculosis.—Much speculation has been indulged in with respect to the relations existing between the various micro-organisms present in the sputum in pulmonary tuberculosis and the bacteriological status of the lung infection. To this end CARL SPENGLER (Ctblt. f. Bak., Dec. 5, 1901) has examined microscopically the sputum of eleven cases of pulmonary tuberculosis and noted the various micro-organisms, in addition to the tubercle bacilli, found therein. The cases were then followed to autopsy and the exact bacteriological conditions of the lungs ascertained. He finds that the infective conditions in the lung are not only qualitatively, but also quantitatively expressed in the sputum. Thus by a microscopical examination of the same the presence and status of a mixed infection can be definitely determined. He divides such mixed infections into multiple, active and passive forms. The organisms found in addition to the tubercle bacillus are numerous but most frequent

are diplo-, tetra-, staphylo- and streptococci. Of especial importance are the streptococci and particularly the streptococcus longus. The appearance of this coccus in the sputum is always of unfavorable omen and is regularly accompanied by high fever and severe general symptoms. The prognostic value of the sputum examinations from this point of view is great.

Icterus and Weil's Disease.—The different forms of icterus, from the simple catarrhal to the toxic and infectious, have been subjects of much discussion. A. MICHELAZZI (Gazz. degli Osped., No. 144, Dec. 1, 1901) reports three cases, of paludal origin, characterized by the same symptoms in varying intensity. The three patients were fishermen, who, in the pursuit of their vocation, had been immersed to the waist for nearly an entire day in muddy, putrid water, subjected to the miasma arising therefrom. All three were taken ill a day or two after exposure. In explanation of the conclusions drawn from the three cases, the symptoms common to all, with differential points showing the variation in reaction to the infection, are given. Chill, fever, headache, muscular pains, meteorism, clay-colored stools, enlarged spleen, enlarged tender liver, and icterus. Case I., the mildest, no albumin in the urine, fever fell by crisis on the sixth day, rapid recovery after the tenth day. Case II., trace of albumin, spleen not enlarged, recovery after eleventh day. Case III., scanty urine, showing albumin and bile pigment in quantity, high fever, all symptoms more intense than in preceding cases, fall of fever by crisis on eleventh day; relapse upon the sixteenth day, with repetition of all symptoms in severity, equal to first illness. In the author's opinion, the clinical picture in the last case corresponds to the condition known as Weil's disease and the opinion of PATELLA is quoted, *i.e.*, that the latter condition is similar to, if not identical with, all forms of icterus characterized by a tendency to relapse. The conclusions drawn are that the same toxin, whatever its nature, may give rise to various forms of icterus, from the lightest to that presenting the symptomatology of Weil's disease, and that the latter should not be considered as a separate pathological entity, but rather as a severe form of recurrent icterus depending upon a greater receptivity of the organism subjected to the toxic influence.

A Typhoid Form of Generalized Staphylococcus Infection.—A number of these cases have been reported which resembled typhoid fever in a striking manner. The onset is accompanied by severe headache and nose-bleed, auscultation shows congestion at the bases of the lungs, the abdomen is distended, the spleen large, there is diarrhea, and Deslongchamps has even observed lenticular rose-spots. The onset is generally more rapid than in typhoid fever, chills more common, and albuminuria more intense and constant. E. HIRTZ and G. DELAMARE (La Presse Médicale, Dec. 14, 1901) report such a case with necropsy. Coming on like typhoid fever, the signs of heart failure soon supervened. On the surface of the kidneys, the mucous membrane of the ileum near the cecum, and through the liver and spleen were scattered tiny white nodules surrounded by a hemorrhagic areola. Neither Peyer's patches nor the mesenteric lymph-nodes were affected. Microscopic examination showed the white nodules to be emboli of staphylococci, and these were found in the spinal cord and medulla oblongata, though not visible to the naked eye. There were no lesions of the myocardium except a single embolus, and the authors attribute the heart failure to the lesions of the bulb in which abscesses were beginning to form. The most common seat of infection in these cases is the skin (15 out of 25 cases), then in order the mucous membranes of the bronchi, digestive tract, uterus and urethra. The case reported lasted seventeen days.

Hysterical Perversion of Senses.—Various disturbances of sensation are met with in this most protean disease, but a very peculiar one has recently been reported by G. W. MCCASKEY (N. Y. Med. Jour., Dec. 14, 1901). Over the lower extremities there was analgesia and over the whole body the sensation to warmth was normal. The interesting part of the case was the remarkable disturbance of the sensibility to cold. Over the trunk and extremities cold was interpreted as heat and the colder the tube the hotter it seemed until ice water appeared to burn. Besides these changes in sensation there were several other stigmata of hysteria making the diagnosis certain.

Transmission of Yellow Fever.—Exceptions are taken by E. SOUCHON (Med. Rec., Dec. 28, 1901) in regard to a recent article by A. H. Doty, in which the latter concludes that "if ships from infected ports have been five days or more in transit and all on board are found to be well after a careful inspection and the use of the clinical thermometer, the vessel, its passengers and crew, shall be released without further detention or treatment." Dr. Souchon has been able to find thirteen cases in which the evidence seems to show that the disease developed at a later period than five days from infection or, at least, later than five days from the time the vessel left the infected port. As a single case brought into a southern port may prove most disastrous, Dr. Doty's rule is considered too lenient.

Amygdalotomy Rash.—The appearance of a rash following the removal of tonsils is seldom mentioned, but its possible presence should be known in order that a mistake in diagnosis be not made. E. A. FORSYTH (N. Y. Med. Jour., Dec. 21, 1901) reports a case in which a small amount of cocaine was used and on the second day after operation a rash appeared on the face, neck and arms and the temperature rose slightly. Scarlet fever was diagnosed on account of the appearance of the rash, but it had entirely vanished in two days. It was thought that too little cocaine was used to account for the trouble. Browne and Wingrave are the only two writers that have ever mentioned such a rash, but they have seen a number of similar cases.

Initial Symptoms of Smallpox.—In a study of one hundred hospital cases of smallpox recently observed in Philadelphia the following facts were noted by W. M. WELCH and J. F. SCHAMBERG (Phil. Med. Jour., Dec. 21, 1901). Of the initial symptoms headache was most constant (86 per cent.), next chills or chilliness (78 per cent.), then backache (70 per cent.), vertigo (57 per cent.), nausea and vomiting (55 per cent). In point of time, chills were first observed in 35 cases, headache in 26, backache in 16, vomiting in 9, vertigo in 2. Severity varied, but in the severe cases, the initial symptom was always well marked. The death-rate was 22 per cent. It was also observed that in unmodified cases there was no marked remission of the fever until the second, third, or even fourth day of the eruption. In many cases, moreover, the early symptoms were interpreted as manifestations of typhoid.

Signs of Presenility.—Various symptoms of this rather frequent condition of the present generation are interestingly described by A. MCL. HAMILTON (Med. Rec., Dec. 28, 1901). Competition and ambition have led to a considerable increase in the mental and physical activity of the average man of to-day and undoubtedly the "strenuous life" has caused many an early "break-down." Mental impairment is one of the first defects noticed and manifests itself in various ways.

Slight emotion causes such persons to become flushed and irascible or to lose their patience. Hypochondriasis develops from that introspection which accompanies a limitation of brain power and easily-produced mental fag. He is indisposed to indulge in argument and arrives at results with the least effort possible. An early impairment of memory is especially annoying. Men between thirty and forty are liable to suffer from headaches of a peculiar kind, undoubtedly connected with changes in the size of cerebral vessels. The pain is suboccipital or frontal and usually bilateral. Many may first complain of what the writer believes to be an early symptom of cerebrospinal ischemia—cramps in the legs. This occurs most frequently at night and in the posterior leg muscles. Giddiness is also important and any unusual cardiac stimulation is liable to bring it on. A peculiar but fairly frequent kind of vertigo is described as the antero-posterior variety, as if "the blood was flowing from the front to the back of the brain." Consciousness is never lost and the state is not a persistent one, except in the matter of its frequent occurrence. Presenile insomnia is usually dependent upon an irritable brain. The avoidance of excesses of all kinds must be strongly urged in these cases, the regular use of considerable amounts of alcohol and tobacco leading to very harmful results by determining the blood supply to brain. Cerebral flushes are especially injurious. Each individual case must be managed according to the indications present, the regulations of one's habits being very important. A beneficial result is apt to follow the judicious use of the hot saline bath, a modification of the Nauheim treatment.

THERAPEUTICS.

Treatment of Paroxysmal Dyspnea in Aneurism of the Aortic Arch.—If purely spasmodic in character, due to reflex from irritation of the recurrent laryngeal nerve, this most distressing condition can be relieved, says F. BUSHNELL (Brit. Med. Jour., Dec. 7, 1901), by laryngotomy and anesthesia. Whether chloroform alone, without laryngotomy, would suffice must depend on the site of the irritation and on the state of the patient. It seems clear that, if the anesthetic did not at once relieve the laryngeal spasm, laryngotomy would have to be at once performed and artificial respiration, with the administration of an anesthetic, resorted to. In many cases the administration of chloroform and amyl nitrite give immediate though unhappily not lasting relief.

Treatment of Abortion.—This term is usually applied to the throwing off of the impregnated ovum at any time from conception till the complete formation of the placenta. H. HUGHES (N. Y. Med. Jour., Dec. 21, 1901) divides it into criminal and simple accidental, the latter of which may be either complete or incomplete. In a case of threatened abortion the patient should be put to bed and at rest, both physically and mentally. Morphine also should be used to quiet the uterus. If abortion becomes evident from the persistence of pain and hemorrhage, any attempt to prevent expulsion may prove harmful. The indications then are to stimulate the pains and control the hemorrhage, and the tampon is by far the most efficient agent for this. Almost any kind of gauze may do, or strips of old muslin, but they must be sterile. Fineness of texture is also important. The rectum should be emptied; a vaginal douche is not usually necessary. The external parts are scrubbed, a drain-pad is adjusted, and a sterile speculum inserted. One piece of gauze is introduced into the cervix which is then closely packed around with gauze and the whole vagina firmly filled with the sterile material. Considerable pressure is needed for if it is not firm the packing will be worse than useless. The succeeding pains are for the patient's benefit and the gauze is generally removed when the pains cease, but it may be left in for twenty-four hours. Retamponing may be necessary, but the fetus is usually found on the gauze or in the vagina on removal of the tampon. In incomplete abortion removal of the secundines is necessary and the patient is prepared as before. Tenacula are used to bring down the cervix, some dilatation may be necessary and a blunt curette is employed to clean the uterus, which is subsequently washed out with creolin, one-half per cent. The vagina is then lightly packed with gauze. To relieve the pain and restlessness the following may be used:

℞ Morphine sulph.	gr. ⅛
Chloral hydrate	gr. x
Sod. brom.	gr. x
Water	oz. ij

Criminal abortion must always be considered as septic. Curettage should be done, followed by douching and packing with iodoform gauze which is left in for six to eight hours. In these cases one's own reputation must be carefully guarded.

Rectal Serumtherapy.—Early in 1896 M. Chantemesse reported his experience, which was most favorable, with this mode of treatment in twenty cases. E. W. COLLINS (Brit. Med. Jour., Dec. 7, 1901) adds some cases of his own and confirms the French observations. In a very severe case of erysipelas of the face he gave antistreptococcus serum by rectum, 10 c.c. each twenty-four hours for three doses. In this case, and in all his diphtheria cases, the result was immediate. The advantages of this mode of administration are a rapidity of absorption almost equal to that of subcutaneous injection without subsequent unpleasant or untoward effects, such as pyrexia, joint pains or skin eruptions. The rectal dose should not exceed that of the subcutaneous injection.

Treatment of Diabetes Mellitus.—To facilitate the discussion of the treatment of diabetes, R. LEPINE (Wiener med. Blät., Nov. 28 and Dec. 5, 1901) divides the patients into (1) diabetics without and (2) those with diacetic acid in the urine. The former class admits of a subdivision into those (*a*) in which the glycosuria disappears after careful dieting, and (*b*) those in which it persists, and the latter into (*a*) those in which the diaceturia readily yields, and (*b*) those in which all treatment is unsuccessful in removing it. Where dieting only is necessary, the ingestion for three days of only proteids and fat will generally suffice to obtain a urine free from sugar, and it is only necessary to keep the patient for several weeks on this diet and then gradually to add carbohydrates. Much more serious are those cases in which the glycosuria persists. Here the absolute meat diet has been advocated, but this irritates the kidneys and increases the albuminuria, enhances the liabilities of diacetic-acid formation, and even leads to more marked glycosuria. It is therefore necessary to reduce albuminous food and to add fat, although this in large amounts may meet with resistance on the part of the patient and may also form a source for acetone. Concerning the second class of cases, various drugs may diminish the acid dyscrasia; of these bicarbonate of soda and gluconic acid are the most valuable and have been known to tide over attacks of coma. The increased consumption of carbohydrates may also lead to an improvement in, or disappearance of, the acid.

Fatty Heart.—The modern conception of the term fatty heart is summed up by C. HIRSCH (Münch. med. Woch., Nov. 19, 1901) as follows: (1) A fatty

heart as a disease *sui generis* does not exist and the term should be altered into cardiac disturbances of the obese. (2) If an obese person under forty years of age, with poorly-developed musculature, shows symptoms of cardiac weakness, the disproportion between the size of the body and the force of heart must be considered as first cause, but others such as coronary sclerosis, or severe functional trouble must be excluded. (3) In the obese of all ages with strong musculature it is more probable that coronary sclerosis, renal changes, arteriosclerosis of the splanchnic vessels or chronic myocarditis is present to account for the symptoms.

Treatment of Anthrax.—The injection of 5 c.c. of a 1-per-cent. solution of collargol directly into the veins has been tried by D. FISCHER (Münch. med. Woch., Nov. 19, 1901) with excellent results in a case of anthrax. After several hours restfulness and spontaneous sleep, with free perspiration, set in and the local symptoms soon abated. Disadvantages were not noticed and the chill by which the injections are sometimes followed can be obviated by carefully freeing the solution from undissolved or precipitated particles of silver.

Fersan in Anemia.—Some excellent results with fersan in the treatment of anemias are reported by A. BASS (Centralbl. f. d. gesamt. Therap., Dec., 1901). A very interesting case is mentioned in which a severe anemia followed gastric dilatation owing to pyloric stricture. Although only one-tenth of the amount of fersan administered passed the pylorus and was absorbed, after five weeks the patient had an almost normal amount of hemaglobin and could with safety be operated upon. The usual daily dose should be about fifteen grams.

Treatment of Cyclic Albuminuria.—After a full meal, after the taking of drugs, such as urea and acetate of potassium, which act as diuretics, after hot baths and with the patient for some time in a horizontal position, P. EDEL (Münch. med. Woch., Nov. 12 and 19, 1901) found in all cases in conjunction with pale and abundant urine a diminution or entire disappearance of albumin. Of greater importance is the fact that exercise, when taken vigorously and with interest, acts in the same way. It is therefore important in treating these cases to resort to dietetic measures and to systematic exercise for heart and respiration. The symptoms of malaise and general weakness of the heart, so often found late in the forenoon, have led the author to give more food during this time and to recommend proper exercise with excellent result. A cautious training of the heart within the same limitations as apply to purely cardiac patients also does good in patients with organic renal disease.

Treatment of Bright's Disease.—In the treatment of acute cases of nephritis W. H. WHITE (Practitioner, Dec., 1901) recommends rest in bed as the most important factor. There is nothing better for keeping the skin at a uniform temperature than a bed, and in acute cases the relationship between the skin and kidneys is especially delicate. The room should be kept constantly at 65° F. and the patient not allowed out of bed or at least out of the room. The diet should always be milk, because it is a simple diet and does not contain anything to irritate the kidneys; it is particularly suitable for fevers, and, lastly, because it is a fluid diet and in acute Bright's it is important to wash out the kidney tubules. For this same purpose large quantities of water have been recommended, but excessive use of water has been found to materially increase the nitrogen excretion. Alcohol is bad for acute cases and so are strong diuretics, but acetate or citrate of potash may be given. Hydragogue cathartics are to be prescribed and frequent sweats produced, subsequent chilling being especially avoided. The best hypnotic is chloralamide in twenty- to thirty-grain doses. During convalescence a very careful return to a more general diet should be made and life in a mild climate should be insisted upon for a time if possible. In cases of chronic tubal nephritis the most striking thing is the extent of effusion of fluid into the connective tissues. This may be partly relieved by rest in bed and purgation. In obstinate cases acupuncture is considered safe if done with surgical precautions. Numerous punctures are made with a triangular needle and a sterile dressing applied and frequently changed. These cases are often kept too rigorously to milk. A feeling of depression and a soft feeble pulse usually mean that a little meat, bread and butter would be helpful. In chronic interstitial nephritis the great essential is to relieve the kidneys as much as possible and therefore the skin must be kept warm and never chilled. Flannels are necessary and a warm climate in winter. Some mineral water containing sulphate of magnesium acts best perhaps to keep the bowels in order. Many false ideas in regard to the diet of these cases have been inherited, the chief object being to diminish the risk of uremia and the percentage of albumin in the urine. The author has paid especial attention to these points in a large number of cases in Guy's Hospital and concludes that "there is no doubt that patients feel better and stronger on a full diet or a nitrogenous diet, such as chicken or fish, than on milk or farinaceous diet, and the liability to uremia is not increased by the more general diet." If the patient is loosing flesh, fats and carbohydrates are desirable. If the pulse tension is low and there is cardiac weakness, meat and beef tea are indicated, for the extractives are strong cardiac stimulants. If the pulse tension is high and the heart hypertrophied extractives are dangerous and may induce cerebral hemorrhage. Thus also a weak heart may do well with a little alcohol, but usually this drug is contra-indicated. Albuminuria in itself is of but little harm to the patient. It has been estimated that even a fifth of the boys at a large public school pass albumin in their urine. In cases of nephritis treatment directed to the diminution of the albumin is unscientific. Furthermore, the author has been unable to discover that the administration of milk in any certain way led to the diminution of the albumin in the urine. The chief guide to the diet should be the state of the pulse.

Potato Diet in Diabetes.—Besides the amylaceous substance which potatoes contain, the water and salts are important. If a person eat potatoes weighing three times as much as the bread ordinarily consumed, says A. Mossé (Bull. de l'Acad. de Méd., Dec. 10, 1901), he will have taken six times as much water and three times as much salt as when living on ordinary bread diet, while the quantity of albuminoid and starchy food will remain the same. The salts of potatoes are chiefly salts of potassium, consisting of potassium in combination with organic acids; these are transformed in the organism into potassium carbonate. Potato diet therefore may be regarded as a sort of alkaline cure, the potassium acting favorably upon the glycolytic function. In 19 out of 20 cases of diabetes reported by Mossé, the substitution of potatoes for bread was followed by a rapid diminution of thirst and glycosuria, and in fact by a general amelioration of the symptom-complex of the disease. The quantity of potatoes administered daily was from 600 grams to three kilos.

The Sanatorium Treatment of Phthisis.—"In our treatment of disease we should realize more fully that the action of pure fresh air is directly curative." These

are the emphatic closing words of an admirable article by R. W. PHILIP (Brit. Med. Jour., Dec. 14, 1901) and embody the essence of the treatment given at the Edinburgh Sanatoria. That this method holds out by far the greatest hope to those infected with tuberculosis is reached by the following conclusions: (1) General condition of the patient. Naturally, it is to the gain in weight that one must look for the most striking evidence of improvement. In the sanatoria good solid tissue is built, both muscle and fat in normal proportion. A gain of sixty pounds within the short space of six months is not unusual. (2) Temperature. The effects of this physiologic, dietetic, open-air treatment is noteworthy. It is very rare to find any pyrexial disturbance among the patients of a properly managed sanatorium. This is not because the lungs have returned to a normal state. On the contrary, they frequently present all the classic signs of cavity formation. (3) Circulation. There are few more beautiful phenomena than the change effected by a physiological life. Within a week or two and sometimes after a few days the rapid soft pulse is replaced by a slowed and resistant beat. The degree to which this is established is to be regarded as of very immediate prognostic value. (4) Alimentary disturbances. Measures directed toward improving the appetite are commonly needless, for it usually returns quickly under the new mode of life. (5) Night-sweats. In no one symptom does the return to a physiological life show itself more markedly or happily. This classic symptom disappears so surely that a continuance of it is to be attributed to ignorance or culpability of those in charge. The conception of pulmonary tuberculosis in the past has been and still is by many too much that of a localized lung disease, while the constitutional condition has been insufficiently considered. So far as treatment goes, the reverse must be the case. The systemic disturbance is immense. To combat this successfully means a vast systemic reformation. A return to the physiological life must be the aim of treatment, whether conducted in a sanatorium or at home. The open or sanatorium treatment has come to stay because it cures and it cures because it is physiological.

THERAPEUTIC HINTS.

Sodium Citrate in Diabetes.—This drug in dosage of 5-10 grams (℥j¼-℥ijss) has been found by P. DALCHÉ and M. CARTERET (Bull. générale de Thérapeutique, Nov. 8, 1901) to be a valuable adjuvant to more powerful remedies in causing a diminished excretion of sugar. It does not upset the stomach, as its decomposition sets free citric acid which is well borne. It may cause diarrhea. In the urine, besides loosening the sugar, it causes decrease in the urea, and increase in the phosphates and chlorides.

Hermophenol.—Hermophenol, the mercury phenol disulfonate of sodium, is a white powder of saline taste, and soluble in five parts of water. It does not precipitate albumin and is not decomposed by soda, hydrochloric acid or ammonium sulphide. It can be heated to 120° C. (248° F.) without change. The mercury salts, as a rule, precipitate albumin, irritate mucous membranes, retard rather than favor, cicatrization, and are painful in hypodermic injection. The gallate, succinate, sulfovinate, etc., organic salts designed to lack these objectionable properties, are no better than the sublimate. Other organic compounds, such as the salicylate, benzoate, peptonate, etc., do not precipitate like the ordinary mercury salts, yet are mostly inferior to the sublimate in solubility, antiseptic properties and content of mercury. A one-per-cent. solution of hermophenol will quickly destroy micro-organisms and only slowly affects the skin. A solution 1 to 500 can be kept in prolonged contact with the skin or mucous membranes without harm and can be injected hypodermically without abscess formation. Bérard is using wipes, tampons, compresses, etc., made of gauze or cotton soaked in a one-per-cent. solution and then sterilized. He has had no inflammatory reaction from application to a peritoneal surface. He employs a 1-to-30 solution for the eyes of all new-born and in ophthalmia neonatorum. He also uses for his hands a soap containing one per cent. of hermophenol, as this salt retains its activity in the presence of soap. Reynès treats his syphilitics by injections every 2 or 3 days of 4 cc. (℥i) of a half-per-cent. solution. The effects are those of the best mercurial, without abscess or other unpleasant sequelæ.—A. MARTINET in La Presse Médicale, Dec. 11, 1901.

Emulsion of Salol.—In certain cases it is advantageous to use salol internally in the form of an emulsion. The following preparation, taken alone or in milk, is recommended in the treatment of gonorrhea and cystitis; each teaspoonful containing 50 centigrams of salol:

℞	Salol	4.0
	Gum arabic	4.0
	Gum tragacanth	0.20
	Tr. tolu	10.0
	Simple syrup	30.0
	Distilled water q.s.	

—Jour. d. Méd. d. Paris, Dec. 8, 1901.

Bronchitis with Bronchoplegia.—In treating bronchitis the two general indications are to lessen the cough and diminish the bronchial secretion. But a third indication, sometimes of great importance, is to combat bronchoplegia, the paralysis of the smooth muscles of the bronchi. This may be due to the toxins of certain infectious diseases, diphtheria, influenza, etc., or may be produced by mechanical causes in the course of chronic bronchitis. There is gradual progressive dyspnea with ineffectual cough, accumulation of secretions and congestion. In such a condition an opiate or other sedative might do great harm, drugs that will stimulate the nervous system and reawaken the bronchial contractility being required. A cardio-tonic and hemostatic pill of value is:

℞	Ext. hyoscyami	0.3	(gr. v.)
	Quin. sulph.	1.5	(gr. xxiv.)
	Ergotin	3.0	(gr. xlv.)

M. Ft. pil. No. xxx. Six or eight pills a day.

Rénaut's treatment of bronchitis is to give balsamics (terpin, syrup of tolu or Canada balsam, Venice turpentine, etc.) for the first four days; then for three days to give ergotin in suppository with opium or hyoscyamus, and at the same time pills of

℞	Ext. hyoscyami	0.3	(gr. v.)
	Terpin	3.0	(gr. xlv.)
	Ergotin	1.5	(gr. xxiv.)

M. Div. in pil. No. xxx. Two or three a day.

In the bronchoplegia of grip, strychnine is the most useful remedy:

℞	Strych. sulph.	0.03	(gr. ss.)
	Ergotin	1.5	(gr. xxiv.)
	Quinin. sulph.	3.0	(gr. xlv.)

M. Div. in pil. No. xxx. Take every two hours with a hot infusion sweetened with syrup of tolu and containing a teaspoonful of old brandy.—A. MARTINET in La Presse Médicale, Dec. 14, 1901.

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ASSOCIATION MEDICAL DEFENCE.

THE adoption of the report of the committee of the New York County Medical Association appointed to draft a scheme for organized medical defence in suits for alleged malpractice makes the first step in an important practical movement that will undoubtedly redound greatly to the benefit of the medical profession. Only last week the *Journal of the American Medical Association,* after reviewing legal decisions in several States that show the permissibility of the formal insurance of practitioners of medicine and surgery by special insurance companies, asked the question, "Would it be practicable and advisable for the State societies of the American Medical Association to take up this work and such profits as may accrue be kept in the profession and not be allowed to outside companies."

The New York County Association makes the first practical response to this question and the details of the scheme of defence organization as presented seem to promise that the difficulties in the matter have been thought out and provided for.

This is a step in the right direction. Undoubtedly the knowledge of union among physicians for defensive purposes will deter many blackmailers from attempting to annoy practitioners into settlement in preference to expensive and time-taking litigation. Lawyers, too, will feel much less like encouraging clients to bring suit unless there is really some good reason. Moreover, such suits will lose much of their personal character. Prosecution will not be attempted for motives of spite and the general public will come to recognize the fact that legal entanglements are not due to deficient knowledge or blameworthy neglect, but to the inevitable uncertainty of human ailments.

The movement thus initiated promises to do more for effective solidarity among the members of the medical profession than almost any other feature of association work. It remains now that the details of the plan of medical defence shall be carefully elaborated and that the difficulties inevitably to be encountered in hitherto untried methods shall not be permitted to discourage those directly interested nor seriously hamper the assured eventual success of organized medical defence.

ELEMENTS WHICH ENTER INTO THE QUESTION OF PROGNOSIS.

IT IS a matter of the greatest importance to be able to give a clear and candid opinion as to the probable outcome of disease and injury. We become so accustomed to the appearances and the phenomena of disease that we sometimes forget (at least some of us do) the intensity of feeling of those who are looking to us for comfort and relief.

How much significance attaches to severe illness, not only in connection with the one who is sick, but with the larger or smaller circle of those who may be associated with or dependent upon the sick one, no one can realize, and, coupled with this, is the distressing thought that we are always hedged in by the limitations of human knowledge and attainments. The doctor's opinion, whether he be the attending physician or the consultant, may be compared to an anchor or a rock to which the patient and his friends cling with desperation. It is at times pathetic to see the faith with which the physician's utterances are received. In the case of individuals of prominence how closely are the bulletins scanned and the opinions and prophecies of this or that attendant analyzed as if he were able to weigh the disease in all its variations!

In those cases in which the situation is sufficiently serious to cause anxiety there are at least

four propositions with which the physician is confronted and to which he is expected to give an answer. If he is unable to answer them himself, he asks for counsel, both for a division of the responsibility and to obtain light from another point of view. Of course, it does not follow that the consultant is any better informed or more competent than the attendant physician, but he has the advantage of considering the case with a freshness of vision which the latter may not have.

The first question which is asked when it is apparent that an individual is seriously sick is, Will he get well? Whether the case be a medical or a surgical one, this question may be an extremely difficult one to answer and in the case of certain severe diseases, especially the malignant ones in which operation may be out of the question or of very doubtful value, it is somewhat of an executioner's task to say, "No, the patient will not get well." What can be more distressing than to banish hope from the human heart? Many doctors have been called brusque and cruel because they have stated cold facts as they saw them. It is not necessary in prognosis to be rough or harsh, and if no ray of hope is apparent to the physician he ought at least to express his adverse opinion in the gentlest possible terms, and assist both patient and friends to meet the inevitable by all the art and tact which he can summon to his assistance.

The next question which must be answered is, How long will the sickness last? In the case of a probably or certainly fatal issue a truthful and correct answer is often very difficult. In the acute diseases a physician of experience may be able to forecast the result with considerable accuracy. In the chronic and malignant diseases it is often impossible to give expression to an opinion in set terms of months, weeks or days. It is certainly expected that an approximate answer will be given and one should at least be able to say within what limits the issue will be probable. If the result is likely to be favorable the requirements are not usually so exacting as in the case of a probably fatal result; but the wise physician should err in placing it at a remote rather than a near limit.

Another question which is of great importance concerns the occurrence of complications. Discredit often comes to the physician because he has not foreseen them, or has not considered it prudent to make such a fact known. It often happens, especially in surgical practice, that an uninterrupted and immediate recovery does not result, and disappointment or vexation may even lead the patient and his friends to question the skill and judgment of the attending physician. It is very desirable to forewarn them if such an issue may be expected. We all know that the best results of certain operations may not appear for six months or a year, and equally that the utmost skill and care may not forestall the necessity for a second operation. Patients should clearly understand this in the forecast which is made of the course and results of the treatment.

The fourth question which is usually asked, and especially in surgical work, concerns the possible return of the disease. It is certainly gratifying when one can give assurance that certain conditions when once removed will not return. However cheerful statistics may be made to appear, the average practitioner knows that the chances are against radical cure for malignant disease. It is also true that the results are sometimes better than our fears may lead us to expect. It is to the younger practitioner that the consideration of the various questions involved in prognosis is of especial importance. He will often make his reputation, good or bad, not alone by what he does but by what he says; and it will be of no little service to him if the opinion prevails that his judgment is acute and reliable, and that he can be depended upon to give a fair statement of the course which a given disease is liable to take.

NEEDLESS LAPAROTOMY.

SOME time ago the *British Medical Journal*, apropros of the frank confession of some diagnostic mistakes by surgeons, suggested that a meeting a year of medical and surgical societies at which only mistakes should be discussed would be an extremely valuable institution. It further suggested that, if deemed advisable, reporters should be excluded from this annual confessional meeting. To deprive the medical public of the benefit to be derived from such confessions would be too bad. *Erranda discimus*, we learn by erring, is as true now as when penned by the old Roman nearly 2,000 years ago. Happy the man who can learn from other peoples' mistakes. He is rare, of course, for personal experience is after all the only real teacher and only the exceptionally wise man ever learns from the mistaken experiences of others. The ideal in medical advance is, however, to profit by the errors of others and so we are glad to be able to present some account of certain entirely justifiable surgical mistakes that under the stimulus of the candidness of Dr. Munro of Boston were the subject of confession at the last meeting of the Har-

vard Society of New York (see MEDICAL NEWS for January 4th, p. 43).

Now that surgery and medicine overlap so extensively in the management of abdominal conditions, surgical findings in cases where diagnosis was at fault are especially suggestive to the medical man. There are many intra-abdominal affections whose differentiation one from another is most difficult. Appendicitis, right oophoritis, and certain biliary affections are liable to almost inextricable confusion in complicated or somewhat unusual cases. There are, however, other pathological conditions supposedly quite distinct in symptoms that may well prove sources of error.

The hope for advance in diagnosis depends mainly on frank confession of errors and the collation of cases that will show the reasons for such errors.

While peritonitis would seem to be, as it actually is in ordinary practice, an easily recognizable condition many an abdomen has been opened in the confident expectation of finding it present, yet the operator has been disappointed. Prof. Koenig of Berlin, an extremely conservative surgeon, exhibited a patient a short time ago before the Berlin Society of Physicians and Surgeons of the Charité Hospital on whom three laparotomies for peritonitis had been done in every instance to disclose an absolutely normal peritoneal cavity. The patient was a man and had some method by which his abdomen become tympanitic and his countenance took on the anxious expression characteristic of peritoneal inflammation, while he complained of all the subjective symptoms of the affection. Successive operators had found the old abdominal scar, but considered this an accessory indication for laparotomy since a second abdominal operation is proportionately more frequently necessary than a first one.

Where stigmata of hysteria exist, or where, as in one of Dr Munro's cases, the morphine habit is present, the possibility of simulation of what are ordinarily urgent surgical symptoms must be borne in mind. It is of extreme importance in our day of justifiable surgical readiness to do abdominal work, to be reminded that acute nephritis may so readily simulate appendicitis or surgical conditions in the biliary tract. For this kidney affection laparotomy can do no good and the effect of the operation will probably work serious injury. The exclusion of nephritis, then, in doubtful cases is absolutely demanded.

Two recent suggestions in kidney surgery, Dr. Reginald Harrison's splitting of the capsule for the acute congestion he picturesquely describes as glaucoma of the kidney, and Dr. Edebohl's establishment of a new circulation through adhesions in chronic nephritis must be borne in mind. At times inevitable laparotomies for symptoms whose basis is the kidney may thus prove not to have been needlessly done.

While there are needless laparotomies frequently performed there is no doubt that true conservatism will in the future lead to the performance of more rather than fewer abdominal operations. Many patients still die every year because of failure to attempt surgical relief in suitable cases. The frank report of errors will lead to a better state of mind and a surer diagnosis. Exploratory laparotomies may remain, in Dr. Manges expressive phrase, the "most dangerous of operations," because of the uncertainty involved, but the domain of uncertainty with regard to the indications for surgical interference will be constantly narrowed by the collation of actual experiences. No one is infallible, least of all in the applications of the eminently fallible principles of applied medicine, but we may rise on stepping-stones of past errors to higher things—from discouraging doubt to the comparative certainty that must remain as yet only the moral certitude of human concerns.

ECHOES AND NEWS.

NEW YORK.

New York Academy of Medicine.—The following candidates to resident fellowship of the Academy have been recommended: Drs. J. C. Ayer, Rudolf Denig, C. R. L. Putnam and P. F. Sondern.

German Medical Society.—At the last regular meeting of this Society, held January 6th, Dr. A. Schrapringer showed a case of Sach's family amaurotic idiocy and Dr. T. Bierhof exhibited a new ureter and irrigation cystoscope. Dr. L. A. Ewald read a paper on "Parametritis Posterior" and Dr. F. Maass a paper on "Operations on Nasal Tumors."

Preventive Medicine.—An opportunity to contribute to the literature of this important department of medical science, with the added incentive of a substantial reward if the work submitted is of noteworthy excellence, is given in an offer, made by the Maltine Manufacturing Company, of Brooklyn, of two prizes, one of $1,000 and one of $500, for the best essays on Preventive Medicine by a practising physician. The company has taken the precaution to exclude the commercial element by making it a condition of the competition that none of their products shall be mentioned, or even indirectly alluded to, and by securing as judges three physicians of unquestioned ethical standing, Drs. Daniel Lewis, of New York, Charles A. L. Reed, of Cincinnati, ex-president of the American Medical Association, and John Edwin Rhodes, of Chicago.

Police Surgeon Examination.—The examination for the position of police surgeon held before the Municipal Civil Service Commission on December 20th has been canceled, and a new examination has been ordered. A reading of the papers of the applicants, of whom there were ninety-seven, revealed some irregularities, with the result that each man who took part in the examination has received notice that a new examination is to be held on January 21, 1902, at 10 a. m.

Would Exclude Consumptives.—Residents of the towns of Liberty, Monticello and Rockland in Sullivan County have combined for the purpose of instituting a vigorous crusade against making these towns resorts for consumptives. Several months ago the Liberty health authorities passed an ordinance prohibiting expectoration in the streets, with a heavy fine attached, since which time tuberculosis patients have carried tin cups for the purpose. Now the town of Rockland Board of Health has passed the following resolution and the town of Liberty one similar to it: *"Resolved*, That no person shall maintain a public or private boarding-house or sanitarium within the limits of the town of Rockland for consumptives, neither shall he receive into his house any stranger or guest, other than his immediate relations or those depending upon him for support, who are suffering from consumption, under a penalty of $50." The village health authorities of Monticello have entered into the movement to the extent of requesting local real estate agents to discriminate against leasing properties to consumptives or their friends.

The New York Academy of Medicine.—A stated meeting will be held Thursday evening, January 16th, at which the following paper will be read: "The Food Factor as a Cause of Health and Disease during Childhood," by Joseph E. Winters, M.D. This will be discussed by Drs. Leroy Milton Yale, Wm. P. Northrup, John Dorning, Floyd M. Crandall, David Bovaird, Jr., Rowland G. Freeman, Allen M. Thomas, Thomas S. Southworth, and J. Milton Mabbott.

Surgical Section, New York Academy of Medicine.—The following is the program for the meeting to be held Monday, January 13th: Operation for Intra-Peritoneal Rupture of Bladder, by Dr. James Pedersen; Oöphorectomy for Inoperable Cancer of the Breast, by Dr. Franz Torek; Removal of Malar Bone for Epithelioma of Cheek, by Dr. C. H. Peck; Operation for Intra-Abdominal Omental Torsion, by Dr. H. Lilienthal; Removal of whole Omentum for Intra-Abdominal Torsion, by Dr. J. Wiener, Jr. Papers: "The Cure of Hydrocele by the Injection of Minute Amounts of Carbolic Acid," by Dr. W. B. Coley; "Clinical Memoranda in the Study of a Case of Anuria," by Dr. A. V. Moschcowitz; New Instrument to Increase the Safety of General Anesthesia, by Dr. Frederic Griffith.

Brooklyn Pathological Society.—At the last regular meeting, held January 9th, Dr. Glentworth R. Butler read a paper on "Pathology of Pleurisy and of Pneumonia." The discussion of its various phases was taken part in by Drs. E. H. Bartley, W. B. Brinsmade, E. H. Wilson, J. M. Van Cott, and J. R. Taylor.

PHILADELPHIA.

College of Physicians.—Officers elected at the January meeting of the College of Physicians are as follows: President, Horatio C. Wood; Vice-President, Arthur V. Meigs; Censors, Richard A. Cleemann, Arthur V. Meigs, S. Weir Mitchell, Horace Y. Evans; Secretary, Thomas R. Neilson; Treasurer, Richard H. Harte; Honorary Librarian, Frederick P. Henry; Councillors, John Chalmers DaCosta and J. P. Crozer Griffith.

Alpha Kappa Kappa Convention.—Physicians and medical students from various parts of the United States assembled in this city January 2d and 3d for the seventh annual convention of the Alpha Kappa Kappa Fraternity. The delegates were guests of the University of Pennsylvania and Jefferson Medical College chapters. The old officers were re-elected as follows: President, George Cook; Vice-President, John I. French; Secretary, John H. Collins; Treasurer, Edward R. Pfarre. At the annual banquet Dr. E. P. Davis acted as toastmaster, speeches being made by Drs. Cook, Wilson and Brace.

Health Report.—Influenza has again become prevalent, four deaths occurring from that disease during the week ending January 4th. For the same period there were 90 new cases of smallpox and 16 deaths. Five new cases of smallpox have occurred at the Philadelphia Hospital, making ten in all. The most active efforts are being made to avert an epidemic in the institution.

Obituary.—The remains of Dr. William Koonz, who died of injuries in the Philippines, were interred January 3d. Dr. Koonz was twenty-six years of age, going to the Philippines soon after his graduation. He died of blood-poisoning which developed from a slight wound on the chin received from a glancing bullet while attending a wounded soldier.

Dr. George W. Caldwell died from apoplexy January 1st.

Philadelphia Academy of Surgery.—At the monthly meeting, held January 6th, there were exhibited two cases of congenital misplacement of the scapula. Dr. W. Barton Hopkins reported a case of suture of tion. The case was that of a sailor who had a comthe acromioclavicular articulation for the cure of luxaplete luxation of four months' standing. The bones were cleaned to allow of perfect opposition and sutured by seven strands of silkwormgut used as one cord. They were introduced by making V-shaped borings in each bone with the points meeting at the line of juncture of the bones, thus forming an X of the entire suture. The result was in every way satisfactory, leading to the conclusion that at times it may be desirable to operate in cases of luxation of the clavicle.

The Annual Address in Surgery was delivered by Dr. Joseph M. Spellissy, his subject being "Abscesses in the Right Iliac Fossa of Other than Appendiceal or Gynecologic Origin." Dr. Spellissy enumerated the various structures in the right iliac fossa which may themselves be the seat of abscess-formation or the final lodging-place of pus having its origin elsewhere. Many cases were reported in which abscesses were due to disease of the vertebræ, sacro-iliac joint, ilium, femur, the muscles, nerves, foreign bodies, typhoid ulceration, etc. In view of the large variety of abscesses met with the question may be asked, "Is the diagnosis of appendicitis difficult?" Articles in the various leading textbooks of surgery were quoted to show the very meager space given to differential diagnosis. Dr. Spellissy stated that, because, as one prominent writer states, "the diagnosis of appendicitis is ordinarily easy," it gives the reason why mistakes are made in the cases referred to as simulating that condition. He concludes that the diagnosis of cases with symptoms referable to the right iliac fossa must be made in each instance with regard to the numerous structures of that region other than the appendix.

Dr. Thomas G. Morton read a statement regarding his first appendectomy following a definite diagnosis. This was performed by him on April 23, 1887, the diag-

nosis having been made before the operation, and was the first case of the kind on record. An appendix had been removed earlier in the year, but the diagnosis of appendicitis had not been first made. Dr. Morton reported the acknowledgment of his claim to priority by other writers who had recently been claiming that honor for themselves.

CHICAGO.

The Physical Effects of the Electrical Charge of Ions and the Electrical Character of Life Phenomena.—Dr. Jaques Loeb, Professor of Physiology in the University of Chicago, and Professor A. P. Matthews, Assistant Professor of Physiology in the same University, contributed a joint paper before the recent meeting of the American Physiological Society on this subject, of which the following is a brief abstract: The unfertilized egg dies soon. A fertilized egg will last for a much longer time. Professor Loeb finds that if the egg of the sea-urchin is treated with certain salts, it has the same effect as fertilization. From his experiments he is of the opinion that death is an active process. If it is not checked, it will lead to disintegration. He has poisoned eggs with potassium cyanide and then counteracted the effects of the poison. The results of the experiments with potassium cyanide have been far more impressive than he has ever dreamed. The poison acts as a preservative by hardening the outer coating. The eggs are taken as soon as they leave the ovary. Two processes are immediately set up. One is that toward death and the other is toward life. Unless some means are employed, the unfertilized eggs will soon die, the process toward death proving the stronger. The potassium cyanide in the experiments that have been made was used in small quantity. It cannot yet be said that in combinations of cells it would have the same effects, and a continuation of the potassium cyanide treatment does not yield the best results. The egg will take a certain quantity of the salt. It will in this manner be given a much longer life. Its life cannot be indefinitely lengthened by the use of the potassium cyanide, because other effects come in to hinder the action of the salt.

The energies of foodstuffs are supposed to generate from heat to mechanical force, yet the lower forms of life and organisms do not have a temperature above their surrounding atmosphere. It is admitted that electrical currents are the main, if not the universal, forms of stimulation, and he has come to the belief that at least a part of the energies of foodstuffs are turned into electrical forces. If one introduces electrically charged molecules in a body, there are interferences in tissue formations similar to those caused from a current of electricity being used. It has been demonstrated that the muscles of a jelly-fish contract when placed in electroids, but not when surrounded by a non-conductor.

Living matter is a liquid solution containing colored particles. Assuming that said particles have a charge of electricity, and that the liquid has an opposite charge, this would account for the fact that they are equally distributed throughout. By sending a current of electricity through the solution, it can readily be demonstrated whether negative or positive electricity prevails in the atoms. In an electro-positive solution, negatively charged ions may be inserted and the same results obtained. So electrically charged ions alter life. By experiment it has actually been shown that positively charged ions bring about or create life.

The joint contribution of Professors Loeb and Matthews may be summarized thus:

1. Motor nerves contain or consist of a colloidal solution, of which the colloidal particles carry positive electrical charges.

2. Nerve (protoplasm) is stimulated by the passage of the colloidal particles from a condition of a solution to that of gelation.

3. This change is brought about by the action of ions, namely, electrically charged atoms or groups of atoms, which bear negative charges. The stimulating action of any chemical compound depends on these negative charges. Those ions having one charge are less efficient than those with two or three.

4. The colloidal particles of the nerve are held in solution by positively charged ions, sodium, potassium, calcium, etc., and the effectiveness of these ions in preventing stimulation varies directly with the number of positive charges they bear.

5. By these facts chemical stimulation is shown to be identical with electrical. Whenever in any part of a nerve negative charges are in excess, the nerve is stimulated, namely, the colloids pass from a solution to a jelly. The stimulus always arises at the cathode.

6. The irritability of a nerve is diminished whenever the solution of the colloids is rendered more permanent. It increases as the nerve approaches the gelation state. All positively charged ions thus diminish the irritability; negative ions increase it. This explains electrotonus, namely, the irritability of the nerve is reduced near the anode, and increased at the cathode.

7. Heat diminishes the irritability of the nerve by rendering the solution more stable. Cold increases it by rendering it less stable. At high temperatures gelation (coagulation) takes place and the nerve is stimulated.

8. The nerve is stimulated mechanically because the colloidal particles are forced together. As they coalesce, their surface becomes less, less positive charges can reside on it, and part of the negative charges previously induced in the surrounding water are temporarily set free in their neighborhood.

9. The negative charges thus set free precipitate the next layer of colloids, which, in their turn, set free negative charges. This precipitates the next layer, and in this way the nerve impulse is carried. Technically, these negative charges are called the negative variation, and this stimulates each successive element of the nerve.

10. Anesthetics all dissolve fat. They reduce the irritability of the nerve or protoplasm, because the colloids in the nerve (protoplasm) are largely fat compounds and more soluble in a mixture of ether and water than in water alone. All anesthetics render the colloidal solution more permanent and prevent gelation.

11. Besides the number of electrical charges on the ions, there is some other factor which determines the action of the salts. Thus potassium is more effective in reducing irritability than sodium; fluorine is far more effective as a stimulant than chlorine, although all carry but a single charge. It is believed that this difference in efficiency in these monovalent anions or kations is dependent upon the rate of rotation of the electron, or the positive or negative point charge, about the atoms with which it is associated. The electron rotates about the fluorine atom about twice as fast as about the chlorine atom.

12. The stimulating action of any anion or the poisonous action of any kation is, hence, a function, first, of the number of charges revolving about the atom; second, of the rate of rotations of these charges; and, third, of the circumference of their orbits.

13. Chemical stimulation is thus by the electro-magnetic theory of life shown to be identical with stimulation by light waves. The stimulating action of any anion increases as the spectrum of that anion approaches the ultra-violet.

14. The long light waves and heat waves resemble in their action that of positively charged ions.

Antivivisectionists Criticised.—At a meeting of the American Society of Naturalists, held at the University of Chicago, Professor William T. Sedgwick, of Boston, not only condemned antivivisectionists, but he decried the influence of workers for physiological temperance in his paper who seek by legislation to turn text-books on physiology into temperance tracts for students. Among other things, he said: "The antivivisectionists have brought into subjection British animal physiology and principal experimental work in biological science. It is to our interest to see that American naturalists are not so hampered. No one in his senses desires vivisection in public schools, except possibly in normal schools, devoted to the education of teachers. Dissection of clams, sea-urchins and snails, and even fishes and frogs, is not out of place, and may be even desirable in high schools and normal schools. Efforts to restrict vivisection have been unsuccessful through the efforts of scientists aided by the President of Harvard, the President of the Massachusetts Institute of Technology, and the Bishop of Massachusetts. It was even proposed in this propaganda to take names of experimenters and in other ways interfere with the freedom of research. While we have cause to rejoice that we have resisted the onslaught of antivivisectionists, we confess with sorrow that we have been less fortunate with philanthropists in an important element of education. Scientific temperance instruction, which seeks to give young people a proper idea of the evils of alcohol has in some instances caused one-fourth of the space in text-books on physiology to be given over to a treatise on the harm of alcoholic beverages. Sometimes the authors of this branch of the work have been capable, and often they have been unfit for their task. The influence of this propaganda has been injurious to the proper teaching of physiology. Laws calling for portions of text-books to be given over to explanations of the harm of alcohol on the system are operating in nearly every State in the Union. It is odious that the exact amount of teaching should be prescribed by law. Text-books for students should not be controlled by a self-constituted and unofficial oligarchy, the leaders of a propaganda which is neither educational nor scientific. Naturalists should also guard against Christian Scientists who refuse to consider the benefits of medicine. Care should be taken that half-baked ideas should not be given force.

Crime in 1901 and Its Future.—Professor Cesare Lombroso has the following to say in one of our local newspapers regarding crime: "Organic crimes, the most atrocious and the most atavistic ones, have materially decreased, not only in number but in criminous intensity as well. One who has studied the most important criminal trials of recent years, like those of Daiming in Australia, Holmes in America, and Tiburzi in Italy, must have observed that the most atrocious and bloody crimes bear some intimate relation to fraud and robbery, and it is no longer pure ferocity nor thirst for blood which represents the motive of such crimes, but rather the greed of gold and that uncontrollable desire for pleasure that has given a special color to criminality and has converted the atavistic and simply brutal criminality into another kind, which might be called intellectual and less repugnant. One who has studied the criminality of London, and, better still, that of Australia, may observe in figures the evident thinning out of the bloody and revolting crimes. It is clearly shown that the crimes against the person numbering 84,000 in 1858 and 92,000 in 1872, fall to 78,000 in 1898. Thus the bloody crime diminishes to the extent of 8 per cent. Robbery and pocket-picking, 30 per cent.; counterfeiting, 34 per cent. But against this we have an increase of 27 per cent. in offences against property from 1876 to 1892, and an increase of 18 per cent. in offences against property based upon vengeance. But crimes against morality have increased from 530 in 1858 to 1,140 in 1898. In Australia, which represents a greater moral evolution than any other section of the world, indicating what the world will be fifty years hence, we see the crimes of blood descend from 182 in 1889 to 162 in 1898. Assassination is diminishing by one-half; stabbing has doubled and homicide has increased almost one-third. Theft in general has decreased from 574 to 394, while fraud and forgery almost one-half, or from 234 to 111; incendiarism from 23 to 16. Under any and all conditions a certain group of crimes of blood and theft still remain, because the degeneration which is favored by civilization, although it finds an outlet in suicides and insanity, will always give a quota, however scarce, of crimes, and a diminution of occasional causes, especially economic causes, will not eliminate all the counter-causes, which are not organic. As a matter of fact, and there is a lesson in these figures, out of 28,323 guilty Australians, 361 were arrested for the third time, 380 for the fourth time, 180 for the fifth time, and 174 for the sixth time, and 204 for between the seventh and the thirtieth time; and by considering the drunkards in a special class, we have 105 habitual criminals from five to ten times, and 18 from eleven to twenty-five times. Even in England the habitual criminal has increased from 55 for over 10,000,000 in 1863, to 60.2 in 1898, and in this calculation I do not include the suicides nor epileptic insane, who are, according to some authorities, a variety of criminality, and which is appallingly on the increase in the most civilized and enlightened countries. In conclusion, crime cannot disappear in the world, no matter what cure we apply to it, but all crimes, with the exception of those against women, will decrease in brutality and in number. We can now look forward to an epoch when the civilized world will consider crime as a strange expectation, as a monstrosity, which all the world will look upon with compassion, mixed with revolt and disgust.

Changes in Cook County Hospital.—The most important improvement made at the County Hospital during last year was the installation of a new heating-plant in accordance with the recommendations of the special commission that investigated the institution early in the year. Warden Healy reports that at present there are 797 patients in the hospital. During the year 20,218 other cases were treated, as follows: Surgical, 13,812; medical, 4,408; contagious, 693; obstetrical, 326; dressing, 979. The surgical cases were divided as follows: Operable, 4,095; general surgical, 8,724; eye, ear and nose, 256, and gynecological, 737. During the year 269 infants were born in the hospital. Supplies for the institution cost $178,201, and salaries, $117,210. The daily average of patients in the hospital during the year was 818, and the total cost for daily maintenance per capita was 98 cents. During the year many reforms have been put into effect by Warden Healy. Internes have been stopped from performing operations in the absence of a member of the attending staff; alcoholic patients have been debarred from the hospital; the doors have been locked against claim agents and solicitors; and a new system of registration has been adopted.

Public Health of Chicago.—The annual report for 1901 of the Chicago Health Department has just been issued. It is shown in the Department's report that Chicago's mortality for the first year of the twentieth century was more than 20 per cent. less than that of St. Louis; 25 per cent. less than that of Philadelphia;

nearly 28 per cent. less than that of Greater New York, exclusive of New York City proper; thirty per cent. less than that of Boston, and nearly 35 per cent. less than that of New York City. The most gratifying feature of Chicago's low death-rate is found in the steady reduction of infant and child mortality. This is directly attributable to the excellent work of the sanitarians connected with the Department. The deaths among those under five years of age in this city fell from 12,801 in 1891, to 8,282 in 1900. In proportion to population, this is a decrease from 110 to 49 per ten thousand, and in proportion to mortality it is a decrease from 46 to 33 per one thousand of the total deaths of all ages. This reduction still continues, and the report concludes that the completed records for 1901 will show fewer than 7,500 deaths under five years of age, or 42 in ten thousand of population, and fewer than 31 in every one thousand of the total deaths. The Department finds the causes for this diminishing mortality, not only among the young, but at all ages under sixty years, to be sanitation and preventive medicine. As to child-life, the causes for diminished mortality are given as the antitoxin treatment of diphtheria, a steadily improving quality of milk supply, medical inspection of the public schools, mid-summer work in the tenement districts, the growth of knowledge on the part of mothers as to care and nursing of the young, the labors of associations, clubs and settlements. In general terms, the diminished mortality is also largely due to permanent sanitary improvements. It will be still further reduced when the intercepting sewers are built and the full benefits of the drainage channel are realized. The report finds encouragement in the fact that even with a practically bankrupt treasury the city is pushing forward these permanent hygienic improvements. Special stress is laid upon the prospective value of the new smoke ordinance, which is designed to purify the city's air supply as the other and most costly enterprises are designed to purify the water supply. There are many other details in this voluminous report well worthy the attention of any man interested in the city's hygienic welfare and vital statistics.

Needs of Cook County Hospital.—Dr. Denslow Lewis, President of the attending staff of the Cook County Hospital, in a recent report to the County Board of Commissioners, made the following recommendations: (1) The construction of a separate building for skin and venereal cases. He suggests that a three-story building be erected, the first floor of which might be utilized by the County agent for the storage and distribution of supplies. (2) Some provision should be made by the proper authorities for the care of inebriates. This includes the victims of epilepsy, apoplexy, mild cases of insanity, heart or kidney disease, the sandbag or other form of assault or accident, who may be found unconscious on the public streets, and who are usually considered to be under the influence of alcohol. A separate building should be provided for the care of alcoholics, under the direction of the attending staff. (3) A children's pavilion apart from the hospital building is desirable. It is often advisable to permit the little patients to get out of doors, and for that reason their ward should be on the ground floor. (4) Provision for the X-ray work will have to be made. Probably $1,500 will be needed. The laboratory is now nearly completed and the funds from the sale of clinic tickets, together with the amounts received from voluntary reduction of salary on the part of the president and certain commissioners, will probably be sufficient for its maintenance. A photographic outfit will be needed later in the year. (5) A card index system for the proper compilation and preservation of the history sheets and other records is a necessity if periodical bulletins are to be issued showing the scientific work done at the hospital. The appropriation of $1,000 made for this purpose last year was not used because the laboratory was not completed, and it was impossible to furnish full reports of cases without instancing the pathological findings.

Vaccination Creed.—Health-Commissioner Reynolds has decided to issue a vaccination "creed," which is to be posted in boarding and lodging-houses. This method for combating the increase of smallpox was adopted by the Health officials recently. The creed calls the attention of inmates of lodging-houses to the value of vaccination. It says: (1) True vaccination, repeated until it no longer "takes," always prevents smallpox. Nothing else does. (2) True vaccination, that is, vaccination properly done on a clean arm with pure lymph and kept perfectly clean and unbroken afterward, never did and never will make a serious sore. (3) Such a vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life and is the only conclusive evidence of a successful vaccination. (4) No outward results ever follow such vaccination; on the other hand, thousands of lives are annually sacrificed through its neglect, a neglect begotten of want of knowledge.

Woman's Medical College to Close.—It is said that the Northwestern University Woman's Medical College will soon be abandoned, for the reason that Mr. Raymond and other trustees declare that the college runs behind about $25,000 a year. This college has not been well patronized of late owing to other schools adopting the plan of coeducation, and among these may be mentioned, Rush Medical College and the College of Physicians and Surgeons. Mr. Raymond is reported to have said: "It is impossible to make a doctor of a woman. Women cannot grasp the chemical and pharmaceutical laboratory work, the intricacies of surgery, or the minute work of dissecting. At our woman's medical department we do not get as high a class of scholarship as is set by the other colleges in the Northwestern University. Dr. R. B. Sheppard has been instructed to open negotiations for the sale of the buildings and grounds of the Woman's College of Medicine. The college was founded in 1870 by Dr. William H. Byford, and in 1891 it was purchased by the Northwestern and incorporated as a department of that University.

Northwestern Medical College Sold.—It is reported that the Northwestern Medical College has been sold to the Valparaiso, Ind., Normal School and the Chicago Eclectic Medical College. The purchase price is given as $40,000, each of the purchasers paying one-half. President Brown, of the Normal School, has guaranteed to furnish the new institution with at least 100 pupils a year, and the Eclectic College expects to be able to furnish as many more.

To Study Scarlet Fever.—There was incorporated at Springfield, Ill., January 4th, the Memorial Institute for Infectious Diseases, founded by Mr. and Mrs. Harold McCormick in memory of their son, John Rockefeller McCormick, who died just a year ago of scarlet fever. The institution has been endowed generously by Mr. and Mrs. McCormick, but for the present it will have no building of its own. At the beginning its researches will be devoted to scarlet fever solely and the work will be carried on in some other medical institution.

CANADA.

Montreal General Hospital.—The following statement for the month of December has been issued by

the officials of the Montreal General Hospital: The admissions into the various wards were 175; discharged, 159; deaths, 13; average daily sick in residence, 159; ambulance calls, 64. There has been a great falling off in outdoor work and in minor operations.

Appointments.—Dr. Doughty has been appointed assistant librarian of the Legislative Library of Quebec. Dr. William J. Abbott, B.A., Brockville, Ont., who is at present in England taking a post-graduate course, has been appointed to a professorship at Cornell University. Dr. Abbott, who is a graduate of Toronto University, will return during the present month to commence his duties.

Toronto Vital Statistics.—The vital statistics for Toronto for the year 1901 are as follows: Births, 4,445; marriages, 2,148; deaths, 3,438. The following are the numbers reported each year since 1893: Births, 4,064, 4,201, 4,131, 4,246, 4,046, 4,122, 4,007, 4,530, 4,445; marriages, 1,507, 1,456, 1,408, 1,601, 1,501, 1,696, 1,842, 1,789, 2,148; deaths, 3,426, 2,778, 2,986, 2,974, 3,125, 2,871, 3,294, 3,604, 3,438.

Smallpox Situation in St. John, N. B.—Under date January 4th, a despatch to the public press states that the people of St. John hope to see the end of the smallpox outbreak in that city at a very near date. Since the beginning of the outbreak three months ago, there have been 98 cases with 22 deaths. At the present time there are less than 30 people in quarantine, and of this number one-half of them have recovered.

Smallpox Situation in Montreal.—There are at the present time but 45 patients in the Civic Hospital, Montreal, with smallpox. At one time there were 71, so the outbreak is declining and the health officials believe they have the disease well under control. There are yet 19 houses quarantined.

Insane in Toronto Jail.—The Grand Jury of the County of York, Province of Ontario, has made a presentment in which they found that there are at the present time no less than 60 lunatics lying in the Toronto jail awaiting transference to some asylum, but as every one of these institutions in the Province is overcrowded, the present conditions will have to prevail until the new asylum at Coburg is opened for the reception of patients. In the House of Providence, the Jury found 20 consumptives being cared for, this being the only institution of a charitable character which would receive consumptives before the recent popular demand opened up the hospitals again to these unfortunates.

Toronto Over-run with Fakirs.—Toronto, usually, like any American city, has its proportion of charlatans, but at the present time there appears to be an epidemic of quackery abroad. Christian Scientists, osteopathists, palmists, spiritualists, and a new cult known as the "Radiators" are daily figuring in the annals of the Police Court, and the whole city seems to be literally infested with these people. The "Radiators" who have devised the "Radiant Health Circle" were making money until they ran foul of the Morality Inspector, who has had them convicted of obtaining money under false pretences and they are at present awaiting sentence. Some palmists are said to be making as high as $25 per day.

National Sanitarium Association's Report.—The medical superintendent of the Muskoka Cottage Sanitarium, Dr. J. H. Elliott, has handed out his report for the last official hospital year which ends September 30th. At the end of the previous hospital year 61 patients remained in residence and there were admitted during the year 127 patients. Of the 99 males treated during the year, 15 have been discharged apparently cured and 29 with the disease arrested. Of the 29, 14 gave promise of cure, but they could not remain longer. Of these 99 on admission, 24 were incipient cases; 43 advanced and 32 far advanced. The average gain in weight was 13 ounces.

Toronto Clinical Society.—At the regular meeting of this Society, held on the evening of the 3d inst, with the President, Dr. J. F. W. Ross, in the chair, Dr. George A. Peters reported three cases of more than passing interest. A specimen of a phosphatic calculus weighing six ounces was exhibited which Dr. Peters had removed by the suprapubic operation. Dr. Peters also described and illustrated his method of cutting calculi. The calculus is smeared over with a light coating of paraffin and then placed between the heels of a horseshoe lying flat on a board, 6 x 16 inches, at one end of it. The shoe and stone are then set in plaster of Paris, when sawing can be done from the end of the board toward which the heels point. Dr. Peters also reported two cases, one esophagostomy and the other dilatation of the esophagus. The first was rendered necessary in a young man who while drinking a cup of tea swallowed a small upper central dental plate with one tooth. This stuck in the esophagus near the cricoid and an operation for its removal was performed successfully. This was the second case of its kind recorded in the annals of any Toronto hospital. Dr. Peters' case of dilatation occurred in a farmer of thirty-five years. The dilatation occurred just above the diaphragm and was caused by compression of the two crura upon the walls of the esophagus. There was no malignancy. This patient died nine hours after a second operation. Dr. D. Campbell Meyers reported a case of peripheral neuritis which simulated tabes dorsalis, and recovery was noted under good doses of arsenic.

GENERAL.

Cancer Among Sailors.—The mortality from cancer among sailors is very high—44.5 per 100,000, while that of miners is only 12.2.

Health of the Philippine Islands.—The sanitary condition of Manila is not satisfactory, and probably will not become so until it is supplied with a satisfactory sewer system and a large number of the buildings remodeled. The city of Manila is located on a flat tract of land and, beside the river which flows through it there are several artificial waterways which connect with the river and into which a number of private water-closets empty. The foundations of most of the buildings consist of sandstone which becomes water-soaked from six to eight feet above the ground. A number of systems for disposing of the night soil, among which may be mentioned cesspools, stone vaults, and sewer systems connected with the river or bay, are unsatisfactory and the Board has recommended the introduction of the pail system until a proper sewer system can be instituted. Bubonic plague was first discovered in Manila in 1899 and up to the present time 778 cases have occurred, resulting in 618 deaths or 79.4 per cent. Great attention is at present directed toward the destruction of rats, which are believed to be the principal cause of the spread of the disease. But five deaths have resulted from smallpox in Manila during the last fiscal year, and the city is believed to be free from that disease. Pulmonary tuberculosis is found to be very common, 160 deaths having occurred during the past two months. This is regarded as a serious problem. Scarlet fever and diphtheria are rare, but measles is occasionally reported.

Rhinderpest and Locust Plague in the Philippines.—Rhinderpest has been prevalent among the cattle and caribou for a number of years and a large number of these animals have been destroyed. The Board of Health has taken the matter up and has sent experts into the provinces for the purpose of teaching intelligent natives the method of inoculating animals, which has resulted rather satisfactorily, and it is believed that in time the disease will be entirely eradicated from the Archipelago. The locust pest has likewise infested the Archipelago for a number of years, in certain instances destroying the crops and resulting in great suffering among the inhabitants.

A New Epidemic Disease Affecting Horses.—Since the invasion of the wet season in the Philippines, a large number of horses have been reported to be suffering from a febrile disease resulting in a great morality. This disease has been found generally present throughout the Island of Luzon, and in several localities all the native horses have died from it. A large number of Government horses also have been affected with this disease, but the mortality among them has not been so great as among native horses. As a rule, the disease appears suddenly and is not noted until too late to treat the animals. It is characterized by the following symptoms: Rise of temperature from 103° to 107° F., apparently without chill, increased abdominal breathing and full pulse. The temperature is rapidly followed by swellings of the pads under the belly, in the sheath, testicles and legs, and accompanied by heart failure and death in a number of cases. At times the disease is attended by emaciation, and may be accompanied by a convalescence of several months. On post-mortem examination, the organs and tissues, as a rule are anemic, in some cases abscesses are noted in the stomach and abdominal cavities; the pericardial sac and pleural cavities are always full of a serous fluid, but with no appearance of inflammatory changes. It does not seem probable that the disease is of a contagious nature, for in stables where there are a number of horses several may be affected while others remain immune. Microscopical examination shows an animal parasite, which shows active and definite movement and pseudopodia along the sides. The disease has proven an interesting one and is being investigated by the Board of Health, under the direction of the Superintendent of Government laboratories. A large number of specimens of blood taken from animals affected with the disease are at present being examined.

Antitoxin Institute.—An institute for the study and treatment of tuberculosis and other infectious diseases has been opened in Genoa by Prof. Maragliano. An antituberculous serum devised by him and prepared at the institute is offered to the medical profession. Prof. Maragliano holds that the remedies in common use, creosote, guaiacol, etc., have no antituberculous action, but that the benefits derived therefrom are due to their power over the secondary infections. Antitoxin is considered to act in the same way as do superalimentation, pure air, etc.; that is, by producing in the organism such changes as to give the blood-serum antitoxic power against the bacillus and its poisonous products.

Syphilis in Morocco.—This disease is widespread in Morocco; in the cities the natives follow the mercurial treatment prescribed by European physicians; but in the country, the treatment is entirely empirical. The patient is secluded in utter darkness for forty days; he is not allowed to eat beef, salt meat, nor olives, and only unleavened bread is allowed him. There is a sulphur spring near Fez which is much frequented by syphilitics.

Hospital for Insane Burned.—One of the new buildings of the Eastern State Hospital for the Insane, at Williamsburg, Va., was burned January 4th. Inadequate fire-fighting facilities, together with the intense cold, made it difficult to cope with the flames. It is believed that several of the inmates perished, and a search of the ruins is being made.

For the Treatment of Consumption.—The King of England's application to anonymous persons for a gift of a million dollars to be devoted to the scientific treatment of consumption is generally applauded, and it is hoped that the next beneficent donor will remember the needs of cancer subjects.

The London Smallpox Scare Continues.—This past week 225 new cases were admitted to the hospitals, against 170, 134, and 161 in the previous three weeks. Yet London, despite the fact that it is the chosen home for the world's outcasts, keeps a lower death-rate than Birmingham, Liverpool, or Manchester, the rate for greater London being 19 last week. Moreover, while 665 smallpox cases were under treatment, the cases of scarlet fever were 3,137, and of diphtheria 1,381.

Pellagralogic Congress.—The second Pellagralogic Congress will be held at Bologna in May. The following are among the subjects to be discussed: (1) Relation Between Pellagra and the Price of Wheat and Corn; (2) Limitation of the Culture of Indian Corn; (3) Clinical Diagnosis of Pellagra; (4) Hygienic Supervision of the Turkish Grain, and Moderation of Its Consumption; (5) Legislation and Pellagra.

Alcohol and Prostitution.—A. Lutaud, discussing the repression of prostitution in France, makes the statement that alcoholism is one of the most profitable sources of income in the house of ill-fame. He quotes the resolutions passed by the French Antialcoholic Union at Lille, November 16, 1901, as follows: "Whereas the sale of alcoholic drinks constitutes a considerable source of revenue to the house of prostitution. (2) Whereas prostitution is in many instances but the unavowed pretext for the sale of intoxicants. (3) Whereas the unhappy women in such establishments are condemned to alcoholism without hope of release. (4) Whereas many among them, by reason of this condition, have the moral sense so blunted that they have no longer strength to escape from their lamentable condition. (5) Whereas suppression of the sale of spirits would have the effect, in many instances, of spontaneous closure of such resorts; be it resolved, that the Administration of Police and municipalities should make every effort to abolish the sale of alcohol in resorts for prostitution.

Eleventh Congress of Russian Physicians.—The Executive Committee announce that the eleventh congress of Russian Physicians and Naturalists will be opened January 2, 1902, at St. Petersburg.

Fourteenth International Congress of Medicine.—It is announced that the eleventh section of this congress, to be held April 23 to 30, 1902, will be subdivided into a department of otology and a department of rhinolaryngology, each having its own president and secretary. The sixteenth section will represent legal medicine and toxicology.

Smallpox at Hackensack.—Smallpox has become epidemic here. On the advice of the State Board of Health the town has been isolated. Guards are posted in the suburbs and no one is allowed to leave or enter the town. Thirty-five cases are reported. The health officers have taken possession of the new town hall as a hospital.

London Health in 1901.—The year 1901 has been very healthy in London. The average death-rate, in a

population of over four and a half millions, was 17.4 per 1,000. The aggregate deaths were 79,601, which is 9,874 fewer than the average for the last ten years. During the first half year there were 7,438 fewer deaths than usual. The rate was above the average throughout November, due to deaths from diseases of the respiratory organs. This was the result of excessive changes in temperature, spells of cold weather being accompanied by fogs. The worst week's rate was 22.3, in November, and the best 13.7, in June.

Kalamazoo's Appendicitis Club.—The Kalamazoo Appendicitis Club is the name of a new organization formed in that city to give aid to the great number of persons now suffering from appendicitis. Its membership hopes also to protect itself against the expense incurred in doctors' fees and loss of time. Seven hundred persons have joined the association. All the money is held in reserve for members' use.

Smallpox in State Home.—One thousand inmates of the State Institution for Feeble-Minded, at Lincoln, Ill., have been placed in quarantine, as the result of the discovery of a number of cases of smallpox at the institution by Dr. J. A. Egan, Secretary of the State Board of Health. The disease had been prevalent in certain wards of the institution for two weeks, but was being treated as chicken-pox by the attending physicians.

Obituary.—Dr. Frederick M. Barrows, one of the most widely-known and highly-resepcted residents of Clinton, N. Y., died at his home on Utica Street last week. About a year ago Dr. Barrows suffered a stroke of paralysis, and a few months ago he became totally blind. Dr. Barrows was born in Connecticut, October 6, 1826. When he was four months old his parents moved to Decatur, Otsego County, N. Y., where he lived until he was twelve years old. In 1835 the family came to Clinton, where he since resided. He attended the Clinton Grammar School and entered Hamilton College, but left it during his sophomore year on account of ill health. Then he went to Geneva Medical College, where he was a fellow student with Dr. Walter Griswold and graduated in 1846. He has practised his profession at Clinton ever since, with the exception of one year, when he lived at Bridgewater. He was engaged in general practice and attended patients in all directions within a radius of ten miles from Clinton. He was a member of the Oneida County Medical Society. Dr. Barrows was a man of scholarly tastes and refined manners. He was imbued with the true appreciation of the duties of a physician and practised the healing art as one who finds his highest gratification that he can relieve suffering humanity rather than from a sordid sense of gain. He was a man of most pleasing address and made friends with all whom he met. His life in Clinton had been long and very useful, and his death will be mourned by the many whom he had helped and befriended. He was a man whom every one loved and honored, and in his death Clinton loses one of its most upright and noble characters. He was a loyal friend, a loving father and a tender husband. During the past two years death has entered his family several times, removing loved ones, but he always bore his trials with the Christian fortitude which has always characterized his whole life. The news of his death will be read with profound sorrow by the entire community. Dr. Barrows was married in 1846 to Lydia Dinsmore, who survives him. He leaves a son, Dr. Frederick E. Barrows, who came to Clinton a year ago to assume his father's practice.

Dr. William Augustus Pierrepont died of heart trouble at his late home, Brooklyn, N. Y., January 5th. Dr. Pierrepont was born in Brooklyn and was forty-six years old. After a preparatory education he studied law at Columbia University, receiving a degree in 1876. He did not practise law, but took a course in medicine at the University of the City of New York, being graduated in 1882. The following year he became resident physician and surgeon of the Brooklyn Hospital, where he remained for two years. After that he practised with Dr. Jasper Griswold in Manhattan.

CORRESPONDENCE.

TRANSACTIONS OF FOREIGN SOCIETIES.

German.

RARE BONE DISEASES: OSTEOGENESIS IMPERFECTA, SENILE OSTEOMALACIA — OSTITIS DEFORMANS — OSTEOPLASTIC CARCINOSIS SECONDARY TO PRIMARY CARCINOMA OF THE PROSTATE—AMPUTATION FOR WIDESPREAD ABSCESSES—THE DISEASE OF BANTI.

THE recent meetings of the German societies have been interesting. These topics were the chief discussed. Lange, as guest at Gesellschaft für Natur-und Heilkunde zu Dresden (Muench. med. Woch., 1901, No. 45) gave a minute report of several autopsies on patients afflicted with bone diseases. The first was a case of osteogenesis imperfecta. The subject was a male child born prematurely of a physically well-developed primipara. It possessed a good layer of body fat and high-grade quantitatively-deficient development of the whole skeleton with a qualitatively-normal formation of bone. Microscopically there was no softening within the endochondral ossification; the bony vault of the skull was not macroscopically examined. There were multiple fractures of the ribs and long bones of the extremities which for the most part presented some effort at healing and redundant formations of callus. On account of these fractures there were very prominent shortenings and deformities in the lower extremities. Infractions were also common.

The second case was one of senile osteomalacia. The patient was a working-woman, seventy-six years old, the mother of thirteen children, admitted to the hospital July 24, 1900, on account of rheumatic pains in the arms and legs and universal high-grade marasmus. When a child she had rachitis. Her death occurred on March 8, 1901, in the presence of symptoms of general marasmus. The features of the autopsy were the following: Brown atrophy of heart; chronic bronchitis; edema of the lungs; atrophy of all tne organs of the abdomen; osteomalacia of the whole skeleton, showing microscopically widespread bony spaces and macroscopically universal atrophy with abnormal softness of the bone. The spinal column showed kyphoscoliosis toward the right in the dorsal region, with compensation toward the left and with lordosis in the lumbar region. The thorax was of irregular form on account of numerous infractions of the ribs. The pelvis was of typical heart shape, with the sacrum bent almost at right angles, with the acetabula pointed forward and the ilia faced outward and overhanging to an abnormal degree. The hip- and shoulder-joints showed arthritis deformans with numerous soft nodular enlargements of the bone about the joint. In addition to this there were scattered areas of new bone formation in the bodies of the vertebræ and in the malleoli.

The third specimen was one of ostitis deformans in a widow sixty-eight years old, born and bred in Dresden, admitted November 26, 1896, with the diagnosis of insanity secondary to multiple alcoholic neuritis. She had had three children and many miscarriages. There had been chronic swelling of the feet for many

years and severe cramps in the extremities. The examination presented fat, soft muscles, bowed tibiæ, and a broad angular forehead. Voluntary motion was very limited, with pain, tenderness and uncertain coordination. She died on August 18th with symptoms of increasing heart-failure and very marked edema of the lungs. In the interval no particular symptoms had occurred. Some time before death her forehead was noticed to be progressively more prominent. At the autopsy there were found the following features: Atrophy of the brain; degeneration of all heart muscles; universal sclerosis of arteries; chronic inflammation of the trachea and bronchi; long-standing congestion of the spleen, liver and kidneys; chronic catarrh of the stomach; scars of gummata in the liver; thickening of the duodenum; ostitis deformans of the whole skeleton. The skull in particular was of irregular thickness in the right frontal bone and in the occiput it had increased to almost two c.m. in thickness and consisted throughout of finely-porous, rather soft bone substance. The fossæ of the cranial cavity were rather flat, the face showed no changes. The vertebral column particularly in the thoracic and lumbar regions together with the sternum showed exactly the same changes. The right humerus contained in the upper third a marked bend, and in this region there was an evident narrowing of the medulla owing to the presence of the finely-porous bone substance in the bone. In the rest of the shaft there were areas of new bone formations. The pelvis was heavy and thick, normal in form except for a tendency to heart shape, the ilia and pubes were very much thickened in cross section their condition was the same as that of the vertebra. The femora showed a curve and thickening toward the front, just below the great trochanter. Here, as in the humerus, was a narrowing of the medulla caused by the presence of the new bone substance. The tibiæ were also curved to the front, irregularly thickening and in the same general condition as the other long bones. The fourth patient had suffered from osteoplastic carcinosis after a primary carcinoma of the prostate. He was also a laborer, sixty-two years old, admitted February 2, 1900, for chronic rheumatism. His history stated that he had never been seriously sick except for the rheumatism which began in 1899, at first in the left then in the right leg and finally becoming general. He was of medium weight, poorly nourished, heavy boned and weak muscled. He died June 23 after some pain and general wasting away. The autopsy showed the following: Brown atrophy of the heart; general hardening of the arteries of the right and left hydrothorax; atelectasis by compression of the lower lobes of both lungs; atrophy of the spleen, liver and kidneys; a new growth at the upper pole of the left kidney in the adrenal gland; primary carcinoma of the prostate; osteoplastic carcinoma of the whole skeleton. The prostate gland was slightly enlarged, hardened, irregularly deformed and not easily distinguishable from the surrounding organs. Sections showed a grayish-white homogeneous mass with a few lighter spots here and there; with the microscope a small-cell infiltrating carcinoma was seen. The cranium was asymmetrical, of irregular thickness, and increased weight. In both frontal bones, in one temporal bone, and in the occiput there were distinct, discrete, grayish-yellow flat bony new growths which for the most part penetrated the whole thickness of the skull. In the interior they were at times diffuse and at times circumscribed masses. In the ribs and sternum there were increased thickness and weight, with most of the spongy and compact bone displaced by a large, hard, gray-white osseous carcinoma. The vertebræ were very heavy and unchanged in form, but the interior of each was invaded by the same type of neoplasm. The pelvis was of the usual form, but the bones were everywhere thickened definitely or in nodes, especially in the ilia and descending rami of the pubes. All of these thickenings were made up of this same gray-white cancerous mass, or of a diffuse, irregular new bone substance. The femora were increased in weight. In the upper part of the neck and just below the great trochanter were new growths of bone the thickness of the finger. In the upper part of the medulla on both sides was the same gray-white tumor, cancerous in nature, in multiple deposits, each about the size of a hazel-nut.

VON BERGMANN, at the Berliner medicinische Gesellschaft, October 30, 1901, read a paper on the amputation of the extremities for widespread progressive abscesses. Contrary to the contention of Virchow that the blood can hardly be a permanent bearer of the bacteriological products of disease, it is to-day established that the penetration of bacteria and their products into the blood and their continued growth there are not only possible but well-established facts. Furthermore, when such a condition of the blood exists, the prognosis in any case is most unfavorable. The good results which have been obtained in such cases of blood infection secondary to phlegmon have been described by Virchow in a Festschrift in honor of the seventieth birthday of Von Coler. The methods of treatment therein described were wide, free and numerous incisions. Occasionally, however, this procedure does not bring about the desired result, and the more radical step of amputation may be necessary. The dictum that has been so freely accepted which teaches that, when the blood has been found to contain the same bacteria as does the phlegmon, the surgeon should then withhold all treatment has been disproved. Recently Dörfler has shown that oftentimes in such cases prompt amputation will lead to a cure. Such treatment seems not only justifiable, but in point of fact the only available thing to be done. The rule by which amputations must be decided upon or avoided depends simply upon the reaction of the abscess under the treatment of free incisions. If the process still continues without abatement, whether the blood does or does not contain the bacteria, amputation should be done forthwith and as high above the phlegmon as possible. Dörfler gives several illustrative cases which his assistant has presented for him. In a series of these cases five show pure cultures of the same bacteria as were in the phlegmon and yet the results were good. The best example is the following case: A student, twenty years old, in alighting from a horse, fell against a passing beer-wagon, injuring his hand. He was immediately taken to the hospital, where two days later his finger was amputated. In spite of this, however, the phlegmon progressed rapidly. Examination of blood taken from a vein on the opposite side of the body was positive, showing numerous streptococci. Wide, free and numerous incisions were made in the diseased member, but without effect upon the infection. Repeated examinations of the blood gave the same results and on the same night amputation of the arm was undertaken. Improvement immediately set in and cure resulted. The most interesting fact in the case is that twice a day for a number of days after the operation streptococci were present in the blood in steadily-decreasing numbers. Fourteen days after the accident they were absent, but on the same day they were found in pure culture in pus from the wound. The man is now

perfectly well and owes his life to that early amputation.

SENATOR presented a paper on the disease of Banti, who described a disease with the symptoms of profound anemia—very great enlargement of the spleen, late appearing tumor of the liver, and ascites. In Italy it is known as Banti's disease. In German literature as yet no notice has been taken of it. It is an interesting fact that this is no new disease. Banti has simply collected in scientific relation a thorough description of a large number of diverse and varying clinical features. He distinguished three stages, as follows: (1) Initial stage, anemia with progressive enlargement of the spleen with a duration of from three to five months; (2) transitional stage, with decrease in the urine, abundant urates, urobilin, and later coloring matter from the bile; duration a few months; (3) final stage, with ascites and tumor of the liver, increasing anemia, slight increment in the white blood-cells, and death after from five to twelve months. The whole disease lasts about six years, occasionally twelve years. If one studies these stages one will find that the first has long been known under the name of primary idiopathic enlargement of the spleen, or splenomegalia. Other names for it are pseudoleucemia (Conheim), and anemia splenica (Griesinger). The later stages are practically those of cirrhosis of the liver with ascites, although some of its features differ slightly from that disease. Banti regards the spleen as the primary and the liver as the secondary seat, because the latter is usually smaller than the spleen. His proof lies in the pathological condition of the spleen, namely, a highly-developed atheroma of the splenic vein, and in the results of treatment. This view of a primary disease of the spleen must be accepted. The cause of the whole disease is an infection or intoxication through the intestinal canal. The ascites may not be in consequence of the cirrhosis of the liver because it is for the most part immaterial and does not increase with the disease of the liver and may disappear through treatment. In the third stage active bleeding through the nose and the intestinal canal is characteristic. During it Banti has found the blood in the condition of simple anemia. Senator has found a disproportionate decrease in the hemoglobin and in three cases a progressive decrease in the number of leucocytes—in other words, a leucopenia. Perhaps this may be characteristic of Banti's disease as an entity. In the marrow of the bones are evidences of profound anemia. Senator then discussed the differential diagnosis between this disease and pseudoleucemia by the increase of lymphocytes, from malaria by the plasmodia, from cirrhosis of the liver by the history and signs, etc. It is possible that this affection is a link between anemia and leucemia. The prognosis is always unfavorable. Removal of the spleen seems to be the only treatment. Eleven cases have been operated on and reported by Maragliano. Only two died and they of hemorrhage. It is very desirable that further data concerning this curious disease should be collected.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON MEDICINE.

Stated Meeting, Held December 17, 1901.

E. Franklin Smith, M.D., Chairman.

Pernicious Anemia.—Dr. James J. Walsh detailed the history of a case of pernicious anemia, with special reference to the etiology suggested by Dr. William Hunter of London, in which gastro-intestinal sepsis is considered the principal causative influence in the disease. Dr. Hunter found that in a series of pernicious anemia cases practically all of the patients suffered from very bad teeth. Usually the teeth did not give very much pain, but were discolored and were evidently the seat of extensive bacterial growth in their carious cavities. The swallowing of these micro-organisms in large numbers, Dr. Hunter thinks, causes deterioration of digestion and finally leads to gastric sepsis. This observation of Dr. Hunter's has not been confirmed by other clinicians, who have been especially watchful with regard to the condition of the teeth in these cases, since Dr. Hunter's publication. Dr. Osler of Baltimore reported, through his assistant, at the last meeting of the American Medical Association, that in the cases of pernicious anemia under his care many of the patients presented bad mouth conditions, but these conditions were not worse than those that occur in ordinary hospital patients suffering from other diseases. English observers have also expressed the opinion that oral conditions were not of as serious etiological importance as Dr. Hunter considers. In New York dentists consulted with regard to the matter expressed the opinion that the bad teeth so common in pernicious anemia were rather an effect than a cause of the disease. The lowered state of the patient's nutrition reduces the resistive vitality of the dental structures and so permits of a more rapid decay.

Antistreptococcus Serum.—Dr. Hunter reported three cases in which antistreptococcus serum was used with very satisfactory results for the treatment of pernicious anemia. The theory of the employment of this remedy is that streptococci are the most virulent micro-organisms that occur in the mouth and consequently the most important in the production of the gastric septic condition. In three cases the use of antistreptococcus serum seemed to produce a remission of the symptoms of pernicious anemia that lasted as long as the patients were under observation.

Case without Oral Infection.—Dr. Walsh's patient was a young woman who had always been extremely careful in the matter of personal cleanliness, so much so that she was considered somewhat of a crank. Her teeth and mouth had always been a source of special attention and they were as clean and sweet as possible notwithstanding the many months during which she had suffered from serious stomachic disturbances. Gastric disturbance was so complete that she retained very little food and growing weakness, the result of inanition, was a marked feature of the disease. As this severe disturbance of the stomach is attributed by Dr. Hunter to some form of gastric sepsis, notwithstanding the presence of good teeth in this case, it was considered advisable, as other remedies failed to bring any lasting relief, to try antistreptoccic serum. Six injections at intervals of three days were given. At the first injection about one-half the dose of serum supplied by the Board of Health of New York was used. There was no local or general reaction. Three days later the full contents of an ordinary Board of Health phial of the serum were employed. This produced a slight local reaction in the shape of a patch of urticaria with some erythema around the point of injection. The third dose produced considerable urticaria over even distant parts of the body. The remaining doses were all of them followed by this discomforting urticaria. There was slight fever, but this was attributed rather to the restlessness produced by the skin eruption than to febrile reaction from the serum.

Therapeutic Effects.—As far as could be seen, absolutely no benefit accrued from the use of the serum

injections. The patient had improved for some time before their employment under the use of nux vomica and arsenic. Vomiting spells, however, had been recurring occasionally and it was in the hope of allaying these that the serum was used. Toward the end of the ...m treatment vomiting became more frequent and about a month after the last injection the patient died. As advised by Dr. Hunter, internal antiseptics, salol and salicylate of bismuth and occasional divided doses of calomel were employed. These seemed to relieve the tendency to diarrhea that occasionally became a marked feature of the affection. Arsenic, however, used as Fowler's solution seemed to do more good than any other remedy.

Failure of Antistreptococcus Serum.—In conclusion Dr. Walsh said that the use of antistreptococcus serum had proved a failure in every disease in which it had been thought possible that it might do good. The reason for this is not far to seek. Under the form streptococcus, it is clear to bacteriologists that a large number of different kinds of micro-organisms are grouped. It is practically impossible to obtain the specific serum opposed to any definite group of streptococci, since we do not know any individualizing characteristics of the different forms.

Probability of Failure.—Dr. Alfred Meyer said that while Dr. Hunter's report had very naturally aroused interest because it offered a hopeful remedy in what had been a hopeless disease, disappointment with regard to the use of antistreptococcus serum in other affections might have led us to anticipate disappointment in this. So far we have no remedy capable of putting an end to the progress of pernicious anemia, though the disease is liable to remissions that have given many remedies a reputation for producing some therapeutic effect.

Causes of Epilepsy.—Dr. Louise G. Robinovitch read a paper involving some clinical considerations of the genesis of epilepsy. The paper was the result of the study of a large series of epileptic cases in the Asile St. Anne in Paris during the last few years. Under the direction of Dr. Magnan of that institution Dr. Robinovitch had special opportunities for the collection of data with regard to the etiological factors in the history of the epileptic patients who are sent to this institution as well as the insane. In the majority of the cases of epilepsy a history of alcoholism in some of the progenitors of the patient could be obtained. Epilepsy in the descendants may be the direct effect of alcoholism in the preceding generation. The mental deterioration may, however, skip a generation and not appear until the grandchildren of the alcoholic individual. Epilepsy is associated with insanity in this matter and alcoholism seems to have a special influence in causing deterioration of the mental condition. The alcoholic influence was not necessarily present in the direct relatives of the epileptic. At times it would seem as though the direct influence of alcohol is so far back in the family history that it can not be traced. In many of these cases, alcoholic tendencies in collateral branches of the family, in uncles or aunts, serve to show the unstable mental condition of the race.

Statistics of Alcoholism.—In 140 cases of epilepsy in which the history was very carefully followed up over 90 cases proved to have traces of alcoholism in the immediate ancestry. This is over 63 per cent. and shows what an enormous influence in the production of this form of mental disease the consumption of alcoholic intoxicants has. Alcohol, as is well known from statistics, increases the birth-rate but greatly increases the death-rate in countries where it is freely used. Children of alcoholic parents are especially liable to die young. Something of this early fatality is due to the fact that such children are prone to be neglected; but still more of the infantile mortality is due to the disturbed nervous system that is transmitted from alcoholic progenitors. The use of alcohol to excess produces epileptiform convulsions. These are not true epileptic seizures. The instability of nervous system which such seizures indicate leads, however, to the occurrence of epilepsy in the descendants. Other direct causes of epilepsy have been mentioned, for instance, the acute infectious fevers during pregnancy or the occurrence of acute infection in the children themselves. Such accidents, however, are very much more frequent than is epilepsy. Some predisposition is necessary before epilepsy occurs. This predisposition is due to the deteriorated nervous system transmitted by alcoholic parents.

Alcoholism and Epilepsy in America.—Dr. W. C. Hollopeter of Philadelphia in discussing Dr. Robinovitch's paper said that he was firmly persuaded of the influence of alcoholism in the production of epilepsy. He has a professional friend whose brothers are epileptic and who is firmly of the opinion that the epileptic seizures are due to the alcoholic history in the family. Alcoholism, however, produces a predisposition not only to epilepsy, but also to other nervous manifestations. Feeble-minded children are especially liable to occur in families with a history of alcoholism. Many of the extremely neurotic children that are seen so frequently nowadays will be found to have alcoholic progenitors.

Dr. Bell of Englewood, New Jersey, said that in cases where several children in the family present neurotic manifestations, he is accustomed to look for a history of alcoholism. He has under his care a family of seven children, most of whom present some serious nervous condition, whose father was a confirmed dipsomaniac. In another case out of a family of six children there is but one perfectly normal child, and the cause of the neurotic conditions present in the others seems to be the family predisposition caused by ancestral alcoholism.

Malarial Poisoning and Epilepsy.—Dr. Bell recently saw a case in which a family history of alcoholism could be absolutely excluded. The patient after a severe attack of malaria developed her first epileptic attack at the age of about four years. The family had been living in New Jersey, but moved away in order to get rid of malaria. After the removal the child had a series of what were called congestive chills and later developed epileptiform convulsions. These continued for a couple of years at irregular intervals and then disappeared for a time. At twelve the patient menstruated and had an attack of epilepsy just before and at the conclusion of her menstrual period, the interval being about four days. This recurred each month for several years. When she was about sixteen, one of her ovaries was removed because of cystic degeneration. For three months after this the patient was well. Then her epilepsy developed again and a distinguished ophthalmologist found that her eyes needed surgical care. A tenotomy was performed and for several months no epileptic attacks occurred. After this period, however, the epilepsy reassumed its sway and the patient continues to have her attacks at each menstrual epoch. The direct cause of these attacks would seem to be some serious disturbance of the nervous system produced by the malarial poison.

Epilepsy and Infantile Eclampsia.—Dr. Berg said that the attribution of the epithet alcoholic to a parent is very easily done, but may not be entirely justified if the details of the case are followed. Dr. Robinovitch claims that in France the use of more than two liters

of wine constitutes alcoholism. Of the ordinary French table wine this would be equivalent to about three liters of beer, that is to say six to eight glasses. There are many workmen in this country who take this amount of beer and yet can by no means be considered to be alcoholics. If this quantity were taken as a standard it would seem easy to find even a greater proportion of parental alcoholism in cases of epilepsy than are exhibited in the statistics presented by the reader of the paper. There is no need to take so far-fetched an etiological factor as alcoholism for epilepsy when we consider how important the occurrence of infantile convulsions is for disturbance of the child's nervous system. Long ago Dr. Seguin taught that all epileptics will be found to have a history of having suffered from eclamptic convulsions in childhood. Epilepsy and eclampsia are nearly of the same character. Epilepsy is really a chronic eclampsia that occurs without immediate cause. The occurrence of a convulsion in childhood, when the nervous system is especially subject to deteriorating influences, gives a special tendency to the occurrence of similar convulsions later on in life if some cause proves sufficient to reawaken the once aroused convulsive center. In a patient that recently came under Dr. Berg's care, the immediate cause of the epileptic seizure was the eating of a plate of veal. The patient was a young college student, who had no memory of ever having had epileptic seizures. His mother, however, recalls the fact that he had a convulsive attack when about two years of age. Notwithstanding the employment of bromides very liberally, he continued to have epileptic convulsions every two or three weeks for several years. It was only when thoroughly brominized that he finally got rid of them.

Standard of Alcoholism.—In closing the discussion Dr. Robinovitch said that the amount, two liters of wine, as the criterion of alcoholism had been established by well-known medical authorities who thoroughly understood both the qualities of their wines and of the French people. It is probable that different standards would be required for different people. For phlegmatic Germans the consumption of the equivalent of this amount of alcohol might not constitute alcoholism; for excitable Frenchmen, however, it means an irritation of the nervous system that must surely prove serious in the long run. It is well known that practically only the children of neurotic parents, or those who are for some reason predisposed to nervous phenomena, are liable to infantile convulsions. In some children a very slight cause is sufficient to bring on a convulsion. In certain families the infectious fevers are always ushered in by a convulsion instead of a chill. This indicates the family predisposition to instability of the nervous system. Careful search of the family history will show that the cause of this predisposition in most cases is alcoholic heredity. Where eclamptic seizures have occurred in childhood it is easy to understand that epilepsy may occur later in life, because the predisposition to these explosions in the nervous system is already present. This does not prove, however, that the convulsion in childhood is the cause but on the contrary serves to show how much the predisposition to nervous manifestations has to do with the earlier and the later seizures. With regard to Dr. Bell's case in which there seemed to be no cause for the epilepsy except malarial poison, Dr. Bell said that the family history with regard to epilepsy was negative. He mentioned, however, that the uncle of the patient had suffered from epileptic seizures after an injury which caused depressed fracture of the skull. Depressed fractures of the skull are only rarely followed by epilepsy and the fact that attacks occurred in this case would seem to point to the existence of a family predisposition to epilepsy. Such histories are often spoken of as negative, when rational examination of them will point out the significance of the tales that are often passed over without due appreciation of their importance.

SYMPOSIUM ON CIRRHOSIS OF THE LIVER.

The following papers were read: Etiology and Pathology of Cirrhosis of the Liver by Dr. James K. Crook; Cirrhosis of the Liver in Children by Dr. W. C. Hollopeter of Philadelphia; Treatment of Cirrhosis of the Liver by Dr. George M. Converse. They will appear in subsequent issues of the MEDICAL NEWS.

Infantile Hepatic Cirrhosis.—Dr. Berg in the discussion of the papers said that very few cases of cirrhosis of the liver came under observation at Mt. Sinai Hospital. Among children in whom Dr. Berg had been especially interested atrophic cirrhosis of the liver had never been noticed. All cases of children's disease admitted to the hospital are carefully examined and the size of the patient's liver is noted, so that it seems improbable that the condition would be passed over. Large livers are common enough in children. These do not seem ever to be true hypertrophic cirrhosis, but rather congestive enlargements of the liver. Dr. Berg thinks that it is a mistake to talk of cirrhosis of the liver in general, meaning thereby both the hypertrophic and the atrophic form of the disease. Hypertrophic and atrophic cirrhosis are very different conditions and should be kept absolutely separate. The term cirrhosis should be limited to sclerotic conditions only. It is this form of cirrhosis, especially when accompanied by dropsy and enlarged veins, that Dr. Berg has never seen in children. The diagnosis of hepatic cirrhosis should never be made while there is fluid in the abdominal cavity. Dr. Berg had this impressed upon him very strongly some time ago in a case in which all the indications seemed to point to the existence of hepatic cirrhosis. After the removal of the abdominal fluid the condition was found to be due to cancer of the stomach pressing upon the portal vein. This had caused not only ascites and hemorrhoids, but had given rise also to the formation of veins upon the abdomen in the form of a typical caput medusæ. The liver proved to be perfectly normal. Any closure of the portal vein may give rise to ascites, and yet this condition is, of course, almost impossible of diagnosis. But after the removal of the fluid from the abdomen the liver will be found to be normal and so the idea of cirrhosis will be given up.

Slow Removal of Fluid.—Dr. Alfred Mayer said that, following the example of a colleague who made the suggestion some twelve or fourteen years ago, he employs a very small cannula for the removal of ascitic fluid instead of the usual large cannula. The removal of the fluid from the abdomen in a short time, something less than an hour, as is usually done, leads to its rapid reaccumulation. The small trocar is allowed to remain in the abdomen and the patient is surrounded by bandage material to absorb the fluid which gradually finds its way out through the small opening in the cannula. Although the evacuation of the ascitic fluid by this slow method is followed much less frequently by its reaccumulation, there are certain objections that have been urged against it. At times the fluid does reappear. Then, the fact that the patient is compelled to lie for several days in wet bandages is considered a serious objection by some. Eczematous conditions of the skin may result from this. Some fear the effect of the cannula upon the intestines. If the instrument has a smooth round end there seems to be no danger, however, of its doing any serious damage.

Premature Evacuation.—Dr. James J. Walsh said that it seems advisable not to evacuate the ascitic fluid before it has begun to exert some pressure upon the abdominal wall. The hope of ultimate relief in these cases is the formation of a large collateral venous circulation in the abdominal walls. This will only form under the influence of considerable pressure within the abdomen. The ascitic fluid, then, should not be evacuated before some pressure symptoms are noted. This is especially true in cases where some dilatation of veins in the abdominal wall is already noted.

Dr. Walsh said that it would be a mistake to think of cirrhosis only or even mainly in connection with alcoholism. Many theories have been advanced involving other toxic agents besides alcohol. It is well known that certain of the mineral poisons, especially lead, can produce cirrhosis of the liver. Copper and mercury undoubtedly also induce hepatic sclerosis very similar to ordinary cirhosis. At the last meeting of the American Medical Association, Professor Vaughan of Ann Arbor called attention to the fact that aluminium seems to be one of the substances which can produce cirrhosis of the liver. As alum is very commonly used in the cheaper grades of baking-powder, this fact should be borne in mind by those who see cases of cirrhosis of the liver in which there is no alcoholic history.

Terminology of Cirrhosis.—In closing the discussion Dr. Crooks said that the terminology of the subject of cirrhosis is all liable to misconception. Cirrhosis itself is a misnomer. Laennec used the word originally to indicate the fawn color of the hard livers which he had observed. Atrophic cirrhosis, of course, should be called chronic interstitial hepatitis. Atrophic cirrhosis is at the beginning hypertrophic cirrhosis. Only the biliary hypertrophic cirrhosis is independent. With this confusion of terms it is impossible to make nice distinctions without misunderstanding.

Dr. Hollopeter said that he had been stimulated to study cirrhosis in children by the English observations. He had seen some cases with Dawson Williams in London last June and undoubtedly there is more of it in this country than is generally supposed.

BOOK REVIEWS.

ELECTRICITY IN MEDICINE AND SURGERY, INCLUDING THE X-RAY. By WILLIAM HARVEY KING, M.D. With a Section on Electro-Physiology by W. Y. COWL, M.D., of Berlin, and a Section on the Bottini Operation by ALBERT FREUDENBERG, M.D., of Berlin. Boericke & Runyon Co., New York.

FOR a long time need has been felt for a concise, terse, complete and modernized work on the subject of electro-therapeutics, yet one which the busy practitioner, not overfamiliar with electro-physics, can read and understand.

Such a book has been written by Dr. King, and, while the electro-specialist unquestionably goes into his subject somewhat more deeply than does the author, it will prove to be of great value to the non-expert, written as it is in an easy, fluent way, and in a manner comprehensible to the novice.

The work, as is customary, treats first of electro-physics (without a knowledge of which electro-therapeutics must ever prove unsatisfactory), followed by a chapter each on the X-ray, motor-points, electro-diagnosis and organic electrology.

Part III., on electro-therapeutics, is subdivided into nine sections, each of which gives a good description of the use of electricity in a different branch of practice, with the choice and strength of current, electrodes, etc., and their application. These are copiously illustrated by drawings and diagrams that, unlike many of their kind, really do illustrate the point to be considered.

Where there are two or more opinions held by authorities on a given subject, both are plainly stated and the reasons for them, thus leaving the reader cognizant with the main facts of each, and capable of an intelligent choice of methods. Coupled with these are the opinions and experiences of the writer and his results.

So many claims of an extravagant nature have heretofore been made for electricity that its trial and failure in certain conditions have had a tendency to bring its employment into the category of unsatisfactory methods. But the fact still remains that it has an important place in modern practice, and its proper application to suitable conditions and cases cannot be denied. That it will ever supplant medicine or surgery in many things is not to be expected, and any such idea would be absurd; that it will greatly aid them, and in some conditions will prove more satisfactory is true; and in this book, the author has endeavored to frankly state his opinions and reasons for them.

The book is handsomely and substantially bound, clearly and well printed from good type on excellent paper, having wide margins, and is of a convenient size and form for holding in the lap. A careful study of its contents cannot fail to give the reader, be he specialist or general practitioner, many points of value to him, and to post him in the important advances of that branch of science, without trying to impress him as to its infallibility.

A TREATISE ON PHARMACY. By CHARLES CASPARI, JR., Ph.G., Professor of the Theory and Practice of Pharmacy in the Maryland College of Pharmacy. Second Edition. Lea Brothers & Co., Philadelphia and New York.

FORMER works in pharmacy have consisted of descriptions of pharmaceutical processes and a résumé of the official preparations in groups according to the classes to which they belong. Professor Caspari treats these sections in a concise and practical manner, but in addition endeavors to give helpful suggestions about every step in the various processes of manufacture. Should an unlooked for color or precipitate appear in a galenical, here will be found the explanation, and, if there be such, the remedy. The author does not recognize the pharmaceutical percentage solution in which solids are weighed and liquids measured, although the Pharmacopœia adopts this idea as being the only practical basis for bedside measurements. In this useful book we should like to see a chapter on "incompatibles" and full treatment of the most used unofficial preparations. The illustrations are numerous and add much to the value of the work.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

ANATOMY IN ITS RELATION TO ART. By Dr. George McClellan. Quarto, 140 pages. Illustrated. W. B. Saunders & Co., Philadelphia and London.

A TEXT-BOOK ON DISEASES OF THE EAR, NOSE AND THROAT. By Drs. Chas. H. Burnett, E. Fletcher Ingals and James E. Newcomb. 8vo, 716 pages. Illustrated. J. B. Lippincott Company, Philadelphia and London.

A TEXT-BOOK OF SURGERY. By Dr. Hermann Tillmanns. Translated from Seventh German Edition by Drs. B. T. Tilton and J. Rogers. Edited by Dr. L. A. Stimson. Vol. I. 8vo, 841 pages. Illustrated. D. Appleton & Company, New York.